Evaluation of the 1996 Municipal and Industrial Water Rates

of the

Central Valley Project of California

Conducted for: **Bella Vista Water District**
Clear Creek Community Services District
Contra Costa Water District
East Bay Municipal Utility District
Placer County Water Agency
Sacramento Municipal Utility District
Santa Clara Valley Water District

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July 31, 1996

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(Note - No appendix is included for Placer County Water Agency because the Agency has been excluded from the M&I rate books.)

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July 31, 1996

Bella Vista Water District
Clear Creek Community Services District
Contra Costa Water District
East Bay Municipal Utility District
Placer County Water Agency
Sacramento Municipal Utility District
Santa Clara Valley Water District

The accompanying report presents the findings from our review of the 1996 Central Valley Project Municipal and Industrial water rates on behalf of seven Central Valley Project water contractors. The interest in conducting this review was prompted by the increasing water rates, as well as a desire by the seven participating districts to better document the ratesetting methodology utilized by the Bureau in the determination of these rates.

Our report provides a general analysis of the rates, costs, delivery data, and other elements of the 1996 rates, addressing the causes for changes in those factors. Special appendices are provided in which we deal with issues that are specifically relevant to each of the participating districts. Our report also provides a general overview of the ratesetting methodology for the CVP including an historical perspective on major changes that have occurred.

Matters that came to our attention in the course of this review that are particularly worth highlighting include the following:

- O&M costs are allocated, as defined in the 1993 Interim Ratesetting Policy, among contractors in proportion to "projected annual water deliveries." Significant changes occur periodically in the delivery factors used, and those changes cause costs to shift between contractors. For example, in 1994 projected deliveries for south-of-delta agricultural contractors were reduced to 50% of maximum entitlements, resulting in a reduction in their rates and an increase in other, principally M&I, contractors' rates. Similarly, in 1996 the allocation of actual conveyance O&M costs to East Bay Municipal Utility District was suspended in recognition of the fact that the District had no capability to accept the contracted water. Because, under the Bureau's current practice, all of the costs allocated to water supply are to be absorbed by some contractor, reductions such as these for south-of-delta contractors and East Bay MUD cause the costs for other contractors to increase.

- A corresponding effect of the changing of delivery amounts occurs with the capital rate. Capital costs are allocated among contractors in proportion to historic and projected future deliveries through the end of the project repayment period. Consequently, changes such as the reduction in delivery projections south of the delta produce a shifting of allocated capital obligation and corresponding interest charges to other contractors.

- There is also a corollary to the elimination of East Bay MUD's conveyance O&M allocation. This is the effect that will occur when the financial responsibility for conveyance facilities is transferred to the local operating authorities. Under this plan, there will essentially no longer be a conveyance O&M component of the water rates since the operations and financial management of the conveyance facilities will rest with the local authorities. However, the Folsom South Canal does not fit into the scheme because it will continue to be operated by the Bureau. Since Sacramento Municipal Utility District is the only remaining agency currently taking water from the Folsom South Canal it is possible that the Bureau may seek to make SMUD solely responsible for the O&M costs, even through it typically takes deliveries of less than 2,000 acre-feet annually from a facility designed to convey more than 600,000 acre-feet. The operating costs of Folsom South Canal generally amount to about $400,000 per year.

- There are two basic interest rates in use for ratesetting purposes. The capital interest rate, which averages about 3%, is used to determine capital recovery rates; and the O&M deficit interest rate, which ranges as high as 10%, is applied in the recovery of O&M deficits. There is disagreement between the contractors and the Bureau over whether additional interest should be treated as a capital cost or as an O&M cost. There is also disagreement over whether additional interest should be compounded on unpaid capital interest and, if so, at what interest rate. We prepared analyses for each district of the effect of different interest assumptions which show that, within a fairly short span of time, dramatic differences in total repayment obligation will occur. In fact, if unpaid capital interest were treated as a capital expense rather than an O&M expense, there generally is not an O&M deficit for the participating M&I contractors.

- In addition to the fundamental disagreement over the appropriate interest rates to be applied in the ratesetting process, the mechanics of the Bureau's process also causes another element of contention. If costs and deliveries were perfectly predictable, then the theory of the Bureau's methodology for determining the capital cost rate should produce a level rate per acre-foot over the repayment period. This means that for contractors with a delayed delivery build-up schedule, their payments during the early stages may not be adequate to cover interest on their capital obligation. However, as deliveries increase in later years, their annual payments grow to the extent that unpaid prior interest and capital are fully repaid by the end of the repayment period. The theory is analogous to a mortgage with a graduated payment schedule. There is negative amortization of principal at first, but the larger payments in later years recover the earlier deficiencies.

The problem with the Bureau's methodology is that it ignores the normal financial concepts for tabulating and recovering negative amortization. Instead, it strips off the amount by which the interest on allocated capital exceeds a contractor's payment, and it recharacterizes that amount as an O&M deficit to be recovered at the higher O&M deficit interest rate.

- Bureau capital costs totaling $9.9 million associated with Contra Loma Dam and Reservoir, and with New Facilities are subject to separate repayment contracts with Contra Costa Water District. However, the costs were also included in system-wide conveyance costs in 1994, 1995 and 1996, with the effect that the conveyance rate was overstated by an estimated $1.15 per acre-foot. The Bureau will correct this error in 1997. However, contractors who paid cost of service rates in those years have overpaid under that component. Based on estimated deliveries, and assuming the estimated $1.15 adjustment is accurate, this correction would generate credits as follows:

	1995		1996	
	Estimated Deliveries	Credit Due	Estimated Deliveries	Credit Due
Bella Vista	5,000	$ 5,750	5,400	$ 6,210
Clear Creek	2,900	3,335	3,100	3,565
Contra Costa	145,500	167,500	145,500	167,325

As noted on page 17 of our report, due to the way the Bureau applies revenues to actual costs, it is unlikely that any excess revenues remained after their application first to annual O&M and secondly to interest expense; therefore, the Bureau does not anticipate issuing any refunds or retroactively adjusting for this error.

- The Water Marketing component of the O&M rate increased from approximately $750,000 in 1995 to $1,500,000 in 1996. This is primarily the result of projected increases in costs associated with water contract administration, and water and power system control operations, as well as the inclusion of specific CVPIA costs reimbursable by the water users.

We encourage your attention to these and other observations that are presented in more detail in the body of this report. If you have questions, please call us.

Santa Clara Valley Water District and
other Participating Districts

This review has been conducted with the concurrence of the Bureau, and Bureau representatives are aware of its findings and conclusions. We want to express our appreciation for the cooperation provided by the members of the Bureau's Finance staff.

Very truly yours,

Richardson & Company

George Cover, CPA

Historical Perspective on the Ratesetting Process

The Central Valley Project of California (CVP) is a reclamation project which was constructed and is being operated under the auspices of the U.S. Bureau of Reclamation (Bureau). The project begun in the 1930's and construction of the main project facilities is now substantially complete. It extends over 600 miles from storage facilities in the Cascade Range near the Oregon border to final water delivery facilities at the southern end of the San Joaquin Valley.

Original construction funds were provided by the United States, and both financing and operating criteria are prescribed by various federal legislative acts. The project is intended to serve a variety of purposes, and the emphasis has changed as conditions and needs have evolved. Perhaps the most succinct original statement of purpose was contained in one of the original authorizing acts, the Act of 1937, which stated:

> *"That said dam and reservoirs shall be used, first, for river regulation, improvement of navigation, and flood control; second for irrigation and domestic uses; and, third, for power."*

Because general public interest purposes such as navigation and flood control were originally viewed as the highest priorities, recovery of costs through the sale of water was not given a great deal of emphasis. In fact, while water and power sales were viewed as important sources of supplemental revenue, the legislative justification for the Project was not heavily dependent on cost recovery principles. The public benefit purposes, including the ability to navigate the Sacramento River with cargo vessels year-round, to access major ports in Sacramento and Stockton, and to substantially control the costly flooding that would periodically occur were major emphases of the Project development. Of the potential supplemental sources of revenue for the Project, the sale of hydroelectric power was viewed as the most significant, and was expected to partially compensate for irrigation water deliveries whose value was limited by the users' ability to pay.

For the first four decades of the Project, contracts for sales of water tended to be executed in blocks as new facilities came in service. The last major block of contracts was executed in the early 1960's as construction of the San Luis unit was undertaken in coordination with the State of California's development of the State Water Project. Substantially all of these contracts established either a fixed price for the water, or a price with only limited provision for increases if operating costs changed. The primary means by which water rates were set during this period was by reference to Project feasibility studies and financial plans. Little emphasis was placed on historically based cost allocations or conventional utility-type ratesetting because the contracts did not call for such analyses, and because the Project was still under development.

In the 1970's a wave of public special interest sentiment arose that challenged the way the CVP was managed both from a financial and an environmental standpoint. This sentiment seemed to be directed primarily at agricultural contractors, who were perceived as deriving unjustified federal subsidies and other benefits from the Project's operation. This special interest pressure was, in all likelihood, one of the factors that motivated the Bureau to develop a water ratesetting methodology, and to gradually migrate water customers to cost-based rates. This pressure also may have been the impetus for legislative activity that produced several new laws affecting the CVP. These were:

PL 97-293, the 1982 Reclamation Reform Act, which significantly limited the agricultural water deliveries to excess lands and established certain water cost principles.

PL 99-546, the 1986 Coordinated Operating Agreement, that authorized the implementation of coordinated operating arrangements between the CVP and the California State Water Project, and also established important principles for recovery of historic costs in future water rates.

PL 102-575, the CVP Improvement Act of 1992, which, among other things, dedicated over one million acre-feet of CVP yield to the environment, established new operating standards and imposed significant charges on water users to pay for mandated environmental mitigation activities.

The legislative and administrative activity occurring in the past 15 to 20 years apparently had its origins in the effort to rectify perceived abuses by agricultural water users who were the consumers of over 90% of CVP water. However, the tides of change swept in significant ways over Municipal and Industrial water users as well. Implementation of important provisions of the new legislation affected agricultural and M&I users equally. Also important was the unanticipated impact that the changes have had on proportionate use of CVP facilities, and corresponding responsibility for costs. To illustrate, in 1981, M&I contractors used 262,000 acre-feet or 6.5% of total CVP deliveries of 4,100,000 acre-feet, with agricultural contractors taking the remainder. By 1993, both agricultural and total deliveries had declined while M&I use had increased to 379,000 acre-feet, representing 10% of the total. Under current projections, this shift is expected to continue so that, by 2004, M&I deliveries will represent 18% of total deliveries.[1]

The Bureau's approach to ratesetting has been in evolution since the shift toward periodically adjustable rates began in the 1970's. Initially the emphasis was on devising a methodology to recover capital costs and, until the mid-1980's, most proposals were based on adjusting rates every five years.

In earlier versions of the ratesetting methodology, all Project capital costs, historic as well as future, were included in the pool of costs to be allocated and recovered. However, future costs were removed from the cost pool in the 1980's and only historic costs of plant-in-service were included. During this time, the project repayment period was fixed as the 50-year period 1981-2030. This decision means that as additional in-basin facilities are placed in service in each year after 1981, they will be recovered over a steadily diminishing repayment period. In-basin facilities placed in service in 1982 will be recovered over 49 years, those in 1983 over 48 years, and so forth.

A cornerstone of the ratesetting process is the allocation of costs among project purposes. Originally, this allocation was done on the basis of an economic analysis of costs and benefits known as the Separable Costs, Remaining Benefits (SCRB) method. The results of that analysis changed over time as the use and value of the Project shifted among purposes. As we noted earlier, the 1937 authorizing act placed high importance on navigation and flood control, with less emphasis on other purposes. **Table 1** which follows illustrates how the Bureau's allocation of costs among project purposes has shifted over time. It also highlights the increased allocation of costs to M&I between 1976 and 1996. (The 1976 costs include future projections.)

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[1] Data from the 1996 M&I and Irrigation Water Rate Tables, Schedule 12. Includes San Felipe out-of-basin amounts and East Bay MUD's minimum contract amount. Excludes Delta-Mendota Exchange Water.

Project Purpose Allocations[2]

	1976		1996	
	Cost in Millions	Percent	Cost in Millions	Percent
Irrigation	$2,363	59.08%	$1,370	42.71%
Commercial Power	603	15.08	459	14.31
Municipal & Industrial	350	8.75	480	14.96
Total reimbursable costs	3,316	82.91	2,309	71.98
Flood Control	141	3.53	134	4.18
Recreation	120	3.00	84	2.62
Fish and Wildlife	79	1.98	166	5.17
Deferred Use	53	1.33	57	1.78
Highway Relocation	40	1.00		
Waterfowl Conservation	20	0.50		
Wildlife Refuge	20	0.50		
Archaeological Studies	13	0.33		
Non-Reimbursable Costs			28	0.87
Water Quality	5	0.13	5	0.16
Navigation	5	0.13	6	0.19
Anadromous Fishery	4	0.10		
Other Specific Costs			208	6.48
Total Non-Reimbursable Costs	500	12.49	688	21.44
Non-Federal Share	184	4.60	211	6.58
	$4,000	100%	$3,208	100%

Table 1

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[2] Allocations for 1976 extracted from report entitled "Review of the U.S. Bureau of Reclamation's Water Rate Policies and Procedures" prepared for Westlands Water District by Ernst & Ernst and dated July 31, 1978. Allocations for 1996 for this Table 1 as well as for Tables 2, 3 and 4 are taken from the Bureau's 1996 Cost Allocation Study.

In 1986, Public Law 99-546 directed the Bureau to perform a complete re-analysis of the project purpose allocation for the CVP[3]. That effort has been in progress for several years, but has not yet been completed.

Until it became necessary to develop a cost-based ratesetting methodology, the Bureau had historically viewed the CVP for financing purposes as one common cost pool to correlate with its operating reality as an integrated unit. However, in the initial development of a methodology, it was concluded that three cost categories were appropriate, storage, conveyance, and pumping. Eventually these evolved into the five categories that are now used - storage, conveyance, conveyance pumping, direct pumping and water marketing (and, for the capital component, an "other cost" category). Under this approach, once the costs have been allocated among project purposes, a sub-allocation is made to the five rate categories. **Table 2** which follows, illustrates the allocation of M&I capital costs used for 1996 rates.

M&I Plant-In-Service Cost by Component

In-Basin:	Millions of Dollars
Storage	$97.00
Conveyance	$91.00
Conveyance Pumping	$9.00
Direct Pumping	$11.00
Other Costs (Defr'd Int. & EIS costs)	$27.00
Total In-Basin	$235.00
Out-of-Basin:	
Conveyance	$201.00
Direct Pumping	$44.00
Total Out-of-Basin	$245.00

Table 2

A similar allocation is performed by the Bureau to allocate estimated O&M costs to the various CVP purposes and to the O&M cost components (described later). **Table 3** illustrates the allocation of O&M costs to the various CVP functions for the 1996 rate book year (reflects 1996 budgeted O&M costs), while **Table 4**, illustrates how these estimated costs were further sub-allocated to the O&M cost components.

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[3] Section 102 of PL 99-546 specifies "(2) The Secretary of the Interior is authorized and directed to undertake a cost allocation study of the Central Valley Project including the provisions of this Act, and to implement such allocations not later than January 1, 1988."

O&M Cost Allocation (Millions of Dollars)

Municipal and Industrial In-Basin	$5.56
Irrigation	$43.23
Commercial Power	$259.51
Fish and Wildlife	$15.30
Recreation	$0.81
Flood Control	$4.47
Navigation	$0.12
Water Quality	$0.52
Total O&M Costs	$329.52

Table 3

M&I O&M Cost by Component (Millions of Dollars)

Storage	$1.73
Conveyance	$0.68
Conveyance Pumping	$0.90
Direct Pumping	$0.73
Water Marketing	$1.52
Total In-Basin	$5.56

Table 4

Another key element of the current ratesetting process is the introduction of the concept of O&M deficits. There remains strong opinion among contractors that the legislative and financial justifications for the O&M deficit rate are questionable. Throughout the remainder of this report all reference to O&M deficits is intended to reflect the fact that this disagreement exists. The amounts and rates reported hereafter represent the Bureau's calculation of the purported O&M deficit. Until the passage of PL99-546, this concept had not been considered by the Bureau in any of its published ratesetting proposals. In fact, most contract rates were established on the basis of feasibility studies which were thought to fully encompass at least the water users' share of capital and O&M costs.

There was presumed to be no deficiency between the water user's payments and their allocated share of O&M costs. In 1986, however, PL99-546 imposed on the Bureau the requirement to recover any annual deficit under the terms of any new or amended contract with the contractor[4].

Following the passage of PL 99-546, the Bureau conducted an historical analysis of costs to determine if there were O&M deficits, and then to assign their calculated deficits among the individual contractors for repayment. It is not clear how the historical analysis of O&M costs and deficits from the 1940's through 1987 was performed. Presumably, the published financial statements for those years would still be available, but the existence of any greater detail is not known. Complicating this analysis would have been the fact that financial record-keeping concepts in the early years would not have anticipated the ratesetting methodologies in use today. For example, the data would not have been collected and tabulated in earlier years in a manner that would be consistent with the five categories of costs required by the current policy. Consequently in compiling the current O&M deficit information, it is likely that the Bureau would have had to make assumptions and use estimates in order to overcome the limitations of the available records. Given the significance of the O&M deficits that have been allocated for repayment, the contractors should be entitled to a report that details the amounts comprising the deficits as well as the method and assumptions used by the Bureau in compiling that data. We are not aware of the availability of such a report.

Accentuating the financial impact of O&M deficits is the Bureau's treatment of unpaid capital interest as an O&M cost. This issue is discussed in more detail later in this report.

Ultimately, in 1988, the Bureau issued an Irrigation Ratesetting Policy and, in 1993, followed with a Proposed Interim M&I Ratesetting Policy. The two are generally similar in approach. The fundamental element of the M&I Policy is the Cost of Service water rate. This rate is intended to recover annually the O&M costs of the CVP allocated to M&I, and to recover over the 50-year repayment period each contractor's purported O&M deficit and allocated share of capital along with interest on both. This Cost of Service rate is now the rate that is being applied to all contractors as contracts are renewed or amended.

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[4] Section 106 of PL 99-546 specifies, "The Secretary of the Interior shall include in each new or amended contract for the delivery of water from the Central Valley project provisions ensuring that any annual deficit (outstanding or hereafter arising) incurred by a Central Valley project water contractor in the payment of operation and maintenance costs of the Central Valley project is repaid by such contractor under the terms of such new or amended contract, together with interest on any such deficit which arises on or after October 1, 1985 at a rate equal to the average market yields on outstanding marketable obligations of the United States with remaining periods to maturity comparable to the applicable reimbursement period of the project, adjusted to the nearest one-eighth of 1 percent."

Current M&I Ratesetting Policy

As previously noted, the Bureau's current M&I ratesetting policy is intended to establish annual water rates that will recoup the Government's cost of providing M&I water to the individual contractors' delivery points, referred to as the Cost of Service[5]. The concept of recovering the Government's cost of providing service is manifested in the Cost of Service rate. The Cost of Service rate is composed of Capital, O&M, and Deficit rate components.

A preliminary step in the determination of annual capital and O&M rates is to accumulate the total pooled cost (as previously described) and the acre-feet of water deliveries applicable to each component. Once the cost and acre-feet have been determined, the basic methodology for computing annual water rates is to divide each component's pooled cost by its corresponding acre-feet of water deliveries. **Chart 1** illustrates this flow of data.

Capital Rate (In-Basin):
The in-basin capital rate is determined by accumulating all M&I capital costs by component (storage, conveyance, conveyance pumping, direct pumping, and other), as of the most recently completed fiscal year, and then dividing each component's costs by its total historical and projected water deliveries for the authorized repayment period of 1981-2030. The resultant component capital rates are then combined, as applicable, for each individual contractor. The combined capital rate is then multiplied by the total quantity of water to be delivered to the contractor during the authorized repayment period, resulting in the capital cost allocation to the contractor. This allocation, less any repayment realized as of the end of the same fiscal year, is then divided by the present worth of remaining deliveries to be made during the repayment period, resulting in the individual capital rate for the then-current water year.

As shown in **Chart 2**, the **storage** capital component consists of the capital costs associated with the collection and storage of project water. All contractors receiving storage services are assigned a project-wide capital rate, except for the Foresthill Public Utility District (which has a fixed repayment contract) and the San Felipe Division contractors whose storage capital rate includes an adjustment for the costs of the San Luis Pumping-Generating Plant. The **conveyance** capital component consists of capital costs associated with project facilities designed and used for transporting water throughout the project. All contractors receiving conveyance services are assigned the same conveyance capital rate. The San Felipe Division contractors have an additional capital rate for the out-of-basin conveyance facilities, which are used exclusively by them (see below). The **conveyance pumping** capital component consists of capital costs of the three main project pumping facilities used to move M&I water through the project. The three main pumping facilities are the Tracy Pumping Plant, the O'Neill Pumping-Generating Plant, and the Dos Amigos Pumping Plant. Separate capital rates are computed for each of the three pumping plants (determined by dividing the recorded capital costs by its total historic and projected deliveries during the 50-year repayment period) and those rates are assigned to contractors based upon their use of these facilities. The **direct pumping** capital component consists of capital costs associated with the relift pumping plants which pump water exclusively for specific contractors. Costs are allocated

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[5] Many M&I contractors originally had fixed rate contracts, which did not require Cost of Service rate payments. However, as those expire, they are being replaced with new or amended contracts containing Cost of Service Payment requirements.

M&I Rate-Setting Overview

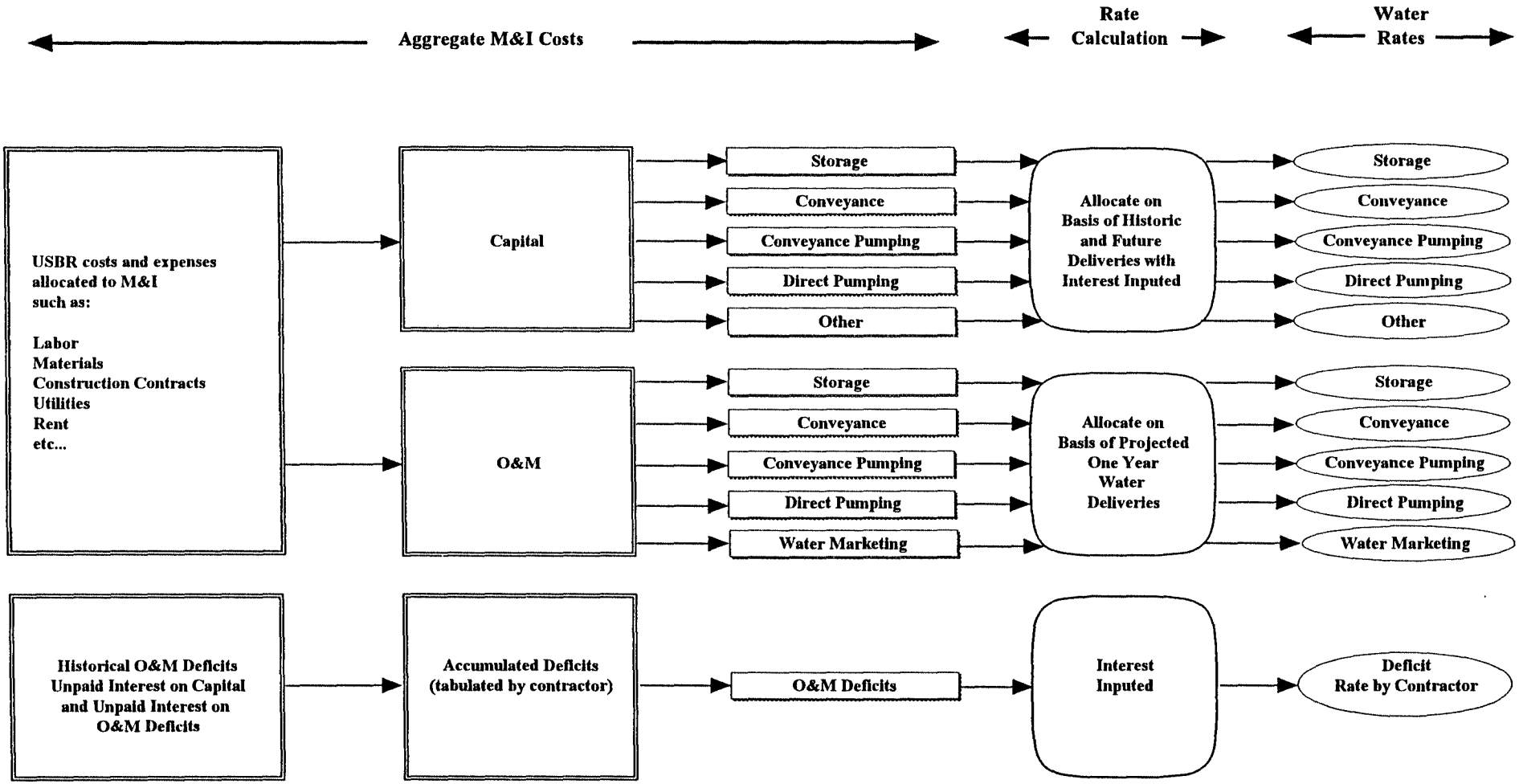


Chart 1

M&I Ratesetting Methodology

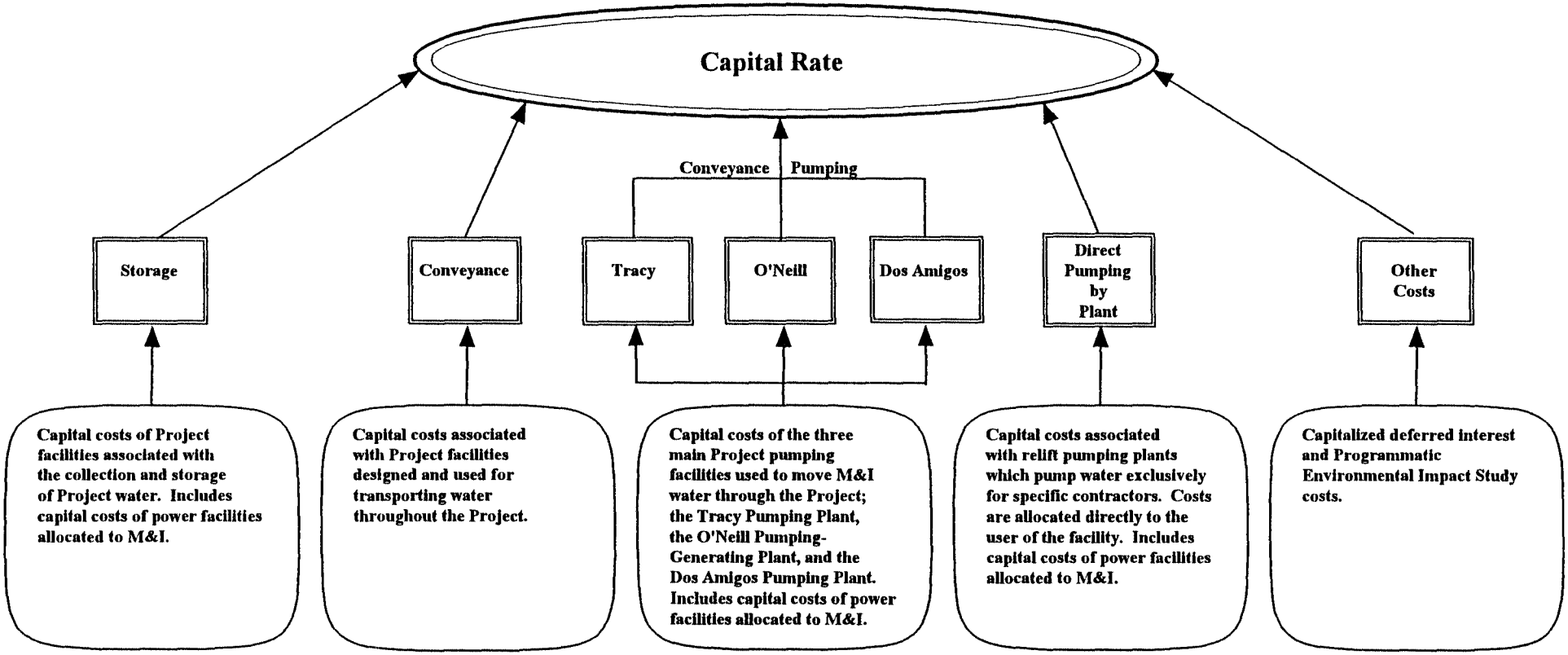


Chart 2

directly to the user of the facility for the plant. The **other costs** capital component consists of capitalized deferred interest and capitalized Programatic Environmental Impact Study costs. Bureau of Reclamation and Department of Energy power facilities capital costs allocated to M&I are included in the storage, conveyance pumping, and direct pumping capital components.

For all of the five capital components, the rate per acre foot is determined by dividing the respective pools of costs by the total historical and projected water deliveries to users of that component over the 50-year repayment period. It is important to note that projected deliveries do not always represent contract entitlements. For example, the projected deliveries for south-of-delta contractors have been reduced in recognition of the Bureau's inability to deliver full entitlement amounts due to environmental restrictions on delta exports.

Capital Rate (Out-of-Basin):
The out-of-basin capital rate is determined in the same manner as the in-basin capital rate (previously described), except that the capital costs, repayment period, water deliveries, and interest rate represent those applicable to the out-of-basin facilities.[6]

O&M Rate:
The annually determined O&M rate is computed by dividing the pooled annual costs by the corresponding projected annual water deliveries for each component (storage, conveyance, conveyance pumping, direct pumping, and water marketing), respectively. Operating cost components are assigned to contractors on the basis of services used to deliver their water supply. The Bureau assigns water marketing services to all water deliveries. While most contractors require storage services, several contractors operate and maintain the storage and conveyance facilities that provide their water service at their own expense. In those cases, the pooled O&M cost components are excluded from their water rates.

As shown in **Chart 3**, the **storage** O&M component consists of the project use energy costs associated with pumping water at the San Luis Pumping-Generating Plant, the Columbia-Mowry System, and the Folsom Pumping Plant. Similar to the treatment of storage capital costs, all storage contractors receive the same storage O&M rate, except for the San Felipe Division, whose rates include an adjustment for the costs of the San Luis Pumping-Generating Plant. The **conveyance** O&M component consists of O&M costs associated with project facilities designed and used for transporting water throughout the project. All contractors receiving in-basin conveyance services, including the San Felipe Division, are assigned the same conveyance rate. The San Felipe Division contractors perform the O&M on the out-of-basin conveyance facilities. The **conveyance pumping**

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[6] We were informed by representatives of San Felipe Division contractors that when the San Felipe Division out-of-basin facilities were constructed, three contractors were authorized to receive CVP water from the facilities. Two of the contractors, the Santa Clara Valley Water District and the San Benito County Water District, currently have contracts and are receiving water. The third future contractor, Pajaro Valley Water Management Agency (PVWMA), cannot at this time enter into a contract because of limitations on new contracts imposed by the Central Valley Project Improvement Act in 1992, but has received assurances from the Bureau that a contract for 19,900 acre-feet of CVP agricultural water service will be negotiated at the first opportunity. The PVWMA is prohibited by state law from importing water into its service area for any purpose except agriculture. However, the cost of capacity to service 19,900 acre-feet to PVWMA is being allocated to the two existing contractors, primarily in proportion to water deliveries. Because the majority of water deliveries to the two existing contractors is for M&I purposes, the majority of the unused capacity costs are being carried as M&I.

M&I Ratesetting Methodology

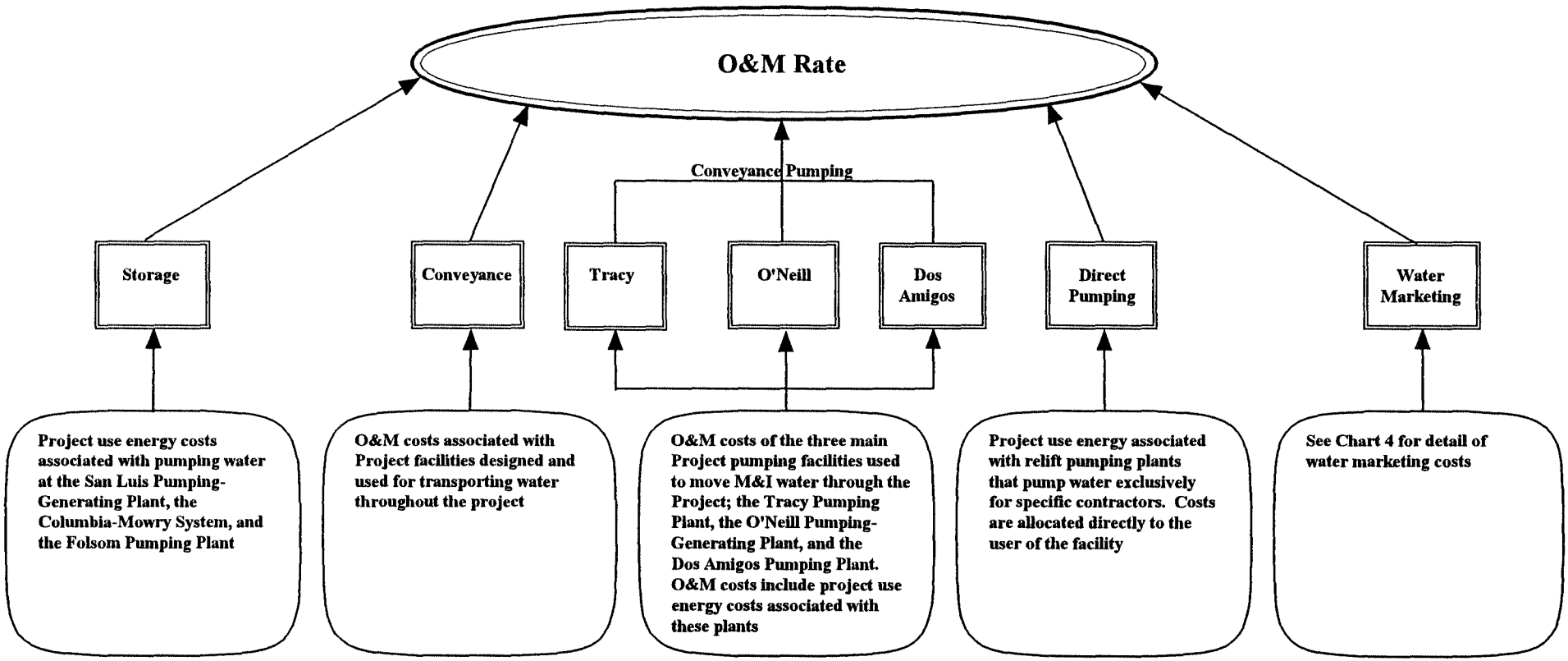


Chart 3

O&M component consists of O&M costs of the three main project pumping facilities used to convey M&I water through the project (these facilities were previously described under the capital rate section). Conveyance pumping O&M costs include project use energy costs associated with the conveyance pumping plants. Total conveyance pumping costs are assigned to pumping plants based on each plant's prorata share of project use energy. Similar to the conveyance pumping capital rate, separate O&M rates are computed for each of the three pumping plants and those rates are assigned to contractors whose water is pumped through these pumping plants.

The **direct pumping** O&M component consists of project use energy associated with relift pumping plants that pump water exclusively for specific contractors. Direct pumping O&M costs consists only of project use energy costs because each pumping plant is operated by a local district at its expense. Costs are allocated directly to the user of the facility.

The **water marketing** O&M component consists of various costs incurred by the Bureau in administering and operating CVP activities. These costs are detailed in **Chart 4** and consist of costs associated with monitoring, administering, and negotiating water service contracts; maintaining water delivery and payment records; accounting for the annual financial results for project water operations; developing annual water rates; as well as certain non-administrative operational functions such as project control system costs.

It is worth noting the delivery data the Bureau uses in its calculations. For O&M rates, the projected deliveries for the applicable year are used. Projected deliveries are typically defined as the maximum contract entitlement of each contractor, giving consideration to build-up schedules. However, there are various exceptions. For example, in 1994 and 1995 the south-of-delta contractors had their projected deliveries reduced in recognition that the CVPIA and other factors will prevent the Bureau from delivering contract entitlements for the foreseeable future. Projected deliveries for M&I contractors were reduced to 75% of entitlements and for agricultural contractors to 50%. However, in 1996 agricultural deliveries were temporarily increased back to 70% in recognition of the large supply of water available. In an unrelated decision in 1996, the Bureau changed its approach to allocating conveyance O&M costs to East Bay MUD. It concluded that because the District was unable to take delivery of its contracted water, it should not be allocated any conveyance O&M costs.

It should be noted that the variances between projected deliveries used for the estimated O&M rates, and the actual deliveries used two years later for the O&M deficit calculation produce significant differences in allocated costs. Consider, for example, the following variances for 1994 (the basis for the 1996 O&M deficit calculation):

M&I Ratesetting Methodology

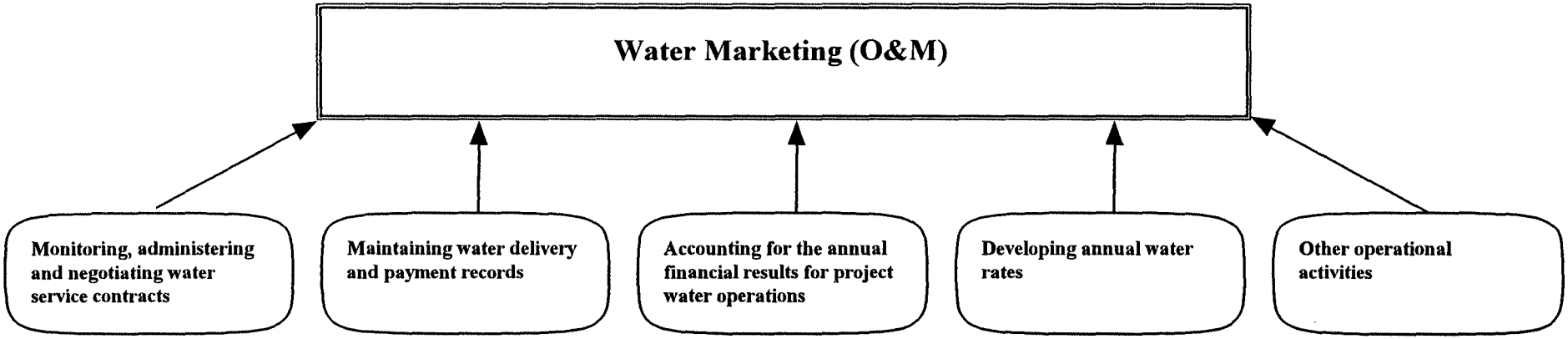


Chart 4

	Fiscal Year 1994			
	Contract Entitlement	Projected Deliveries[7]	Actual Deliveries[8]	Difference
Bella Vista Water District	24,000	4,500	6,674	2,174
Clear Creek Community Services District	15,300	2,700	2,329	(371)
Contra Costa Water District	195,000	145,500	134,903	(10,597)
East Bay Municipal Utility District	150,000	45,000	-0-*	(45,000)
Placer Co. Water Agency	117,000#	N/A	N/A	-
Sacramento Municipal Utility District	60,000	5,000	1,727	(3,273)
Santa Clara Valley Water District	152,500#	92,000	81,842	(10,158)

* for conveyance only; 52,500 was used for storage and water marketing components
represents total agricultural and M&I entitlements, without distinction as to type.

Capital costs are allocated differently from O&M costs. They are allocated in proportion to the sum of actual historical and projected future water deliveries. Accordingly, when changes are made in the projected delivery assumptions, significant shifts of costs between contractors can occur. For example, the south-of-delta adjustment described earlier was also applied to the projected deliveries used for capital purposes, and it resulted in a significant shifting of allocated CVP capital costs to other contractors, and particularly to M&I contractors.

Individual contractor deficit recovery rates are computed by dividing the Bureau's calculation of the accumulated deficit balance by the present worth of that contractor's projected deliveries over the remaining repayment period. The present worth of each contractor's projected deliveries is computed using each contractor's composite deficit interest rate. As illustrated in **Chart 1**, a contractor's accumulated deficit balance consists of the following:

- Unpaid O&M costs
- Unpaid interest on capital costs
- Unpaid interest on the sum of these two

Chart 5, which follows, depicts the methodology for determining the O&M deficit rate. Also, for additional information regarding the composition of this component, see the section of this report titled, "Evaluation of the change in contractor deficits".

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[7] 1994 Municipal and Industrial Rates table, schedules A-12.

[8] 1996 Municipal and Industrial Rates table, schedules A-12.

Central Valley Project
Schematic of O&M Deficit Calculation

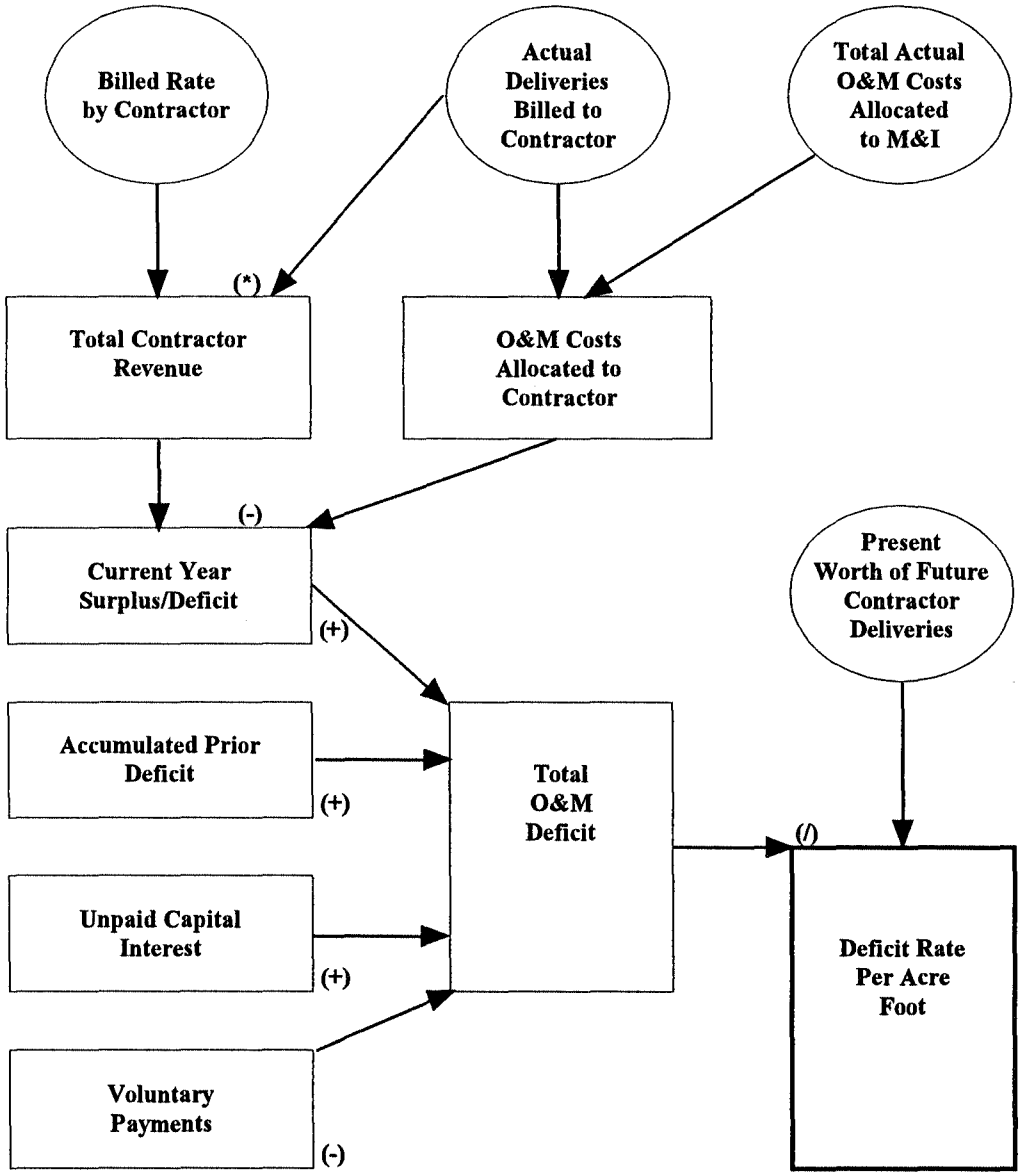


Chart 5

It is the Bureau's intent that the Cost of Service rate should generate revenues sufficient to cover the annual operating costs of the CVP and ensure repayment of capital investment by the end of the project repayment period. In practice, however, payment of the Cost of Service rate does not guarantee that a contractor will cover their allocated share of annual O&M costs for the year and achieve capital repayment. This is due to several factors:

- Actual costs may, and in fact often do, differ substantially from estimates used for initial O&M ratesetting.

- Actual deliveries will differ from estimated deliveries because hydrologic conditions and contractors' demands do not coincide with the Bureau's estimates.

- Interest costs on O&M deficits can exceed the amounts included in the methodology used for calculating Cost of Service rates.

In tabulating the results of operation for a year, the Bureau applies a contractor's calculated revenues in a specified order, first to current O&M and interest expenses. Revenues in excess of current year expenses are then applied first to repaying allocated capital costs, and second to unpaid prior year O&M costs. Under this scheme, if revenues for a contractor are less than the contractor's share of actual expenses, then the deficiency results is underpayment of the cost elements as defined in this hierarchy.

Further compounding this problem is the manner in which unpaid interest on capital is treated as an O&M expense. This issue is described in more detail in the "Special Aspects" section of this report.

As a consequence, under the USBR methodology the contractor's deficit may increase even when paying Cost of Service rates. This situation is exacerbated, of course, for old contracts with rates substantially less than Cost of Service.

To overcome the flaws inherent in the ratesetting methodology that allow O&M deficits to increase even when Cost of Service rates are being paid, the Bureau has established a Voluntary Payment program. Under this program, the Bureau determines the results of operations for each contractor after the close of the year, and notifies the contractor of their deficit or surplus for that year. The contractor then has 30 days in which to pay their current year deficiency, if any, and no interest will be charged on that amount. Any remaining deficit from prior years, however, continues to be subject to interest.

Statistical Analysis

Our statistical analysis focused on the underlying costs that went into the ratesetting process in order to establish overall trends and explanations for significant or unusual fluctuations. We subsequently examined the water rates to determine whether those trends were, under the Bureau's methodology, appropriately reflected in the rates themselves. The following is a discussion of the more significant fluctuations noted during our analysis. Our analysis does not focus specifically on individual contractors; however, there is a direct correlation between the fluctuations examined here and their impact on individual contractor water rates. We have presented graphs depicting changes in each individual contractor's rates in separate appendices of our report. Refer to those graphs in conjunction with reading this section of the report in order to better visualize the impact that the fluctuations discussed here have on individual contractor water rates.

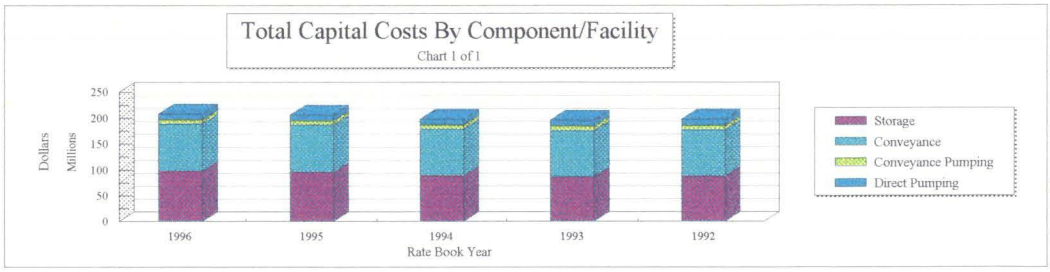
Comparison of Capital Costs by Component/Facility and Impact on Water Rates

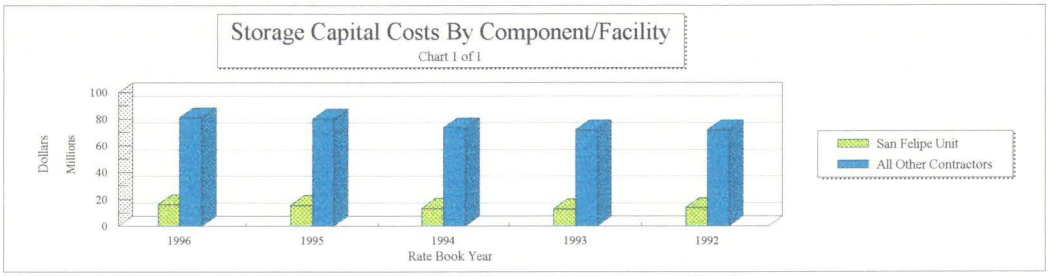
Figure 1 illustrates the changes in capital costs by component and by facility that have occurred over the five year period from rate book year 1992 through 1996. Capital costs used in the ratesetting process represent the capital costs as of the end of the Bureau's second preceding fiscal year, which results in a two year lag between the rate book year and the capital cost used in the ratesetting process. The capital costs presented in Figure 1 are for Bureau fiscal years 1990 through 1994. Our analysis of these capital costs indicated that they have been relatively stable over the five year period. We did note significant fluctuations in storage capital costs allocated to all contractors between rate book years 1994 and 1995, and in conveyance capital costs allocated to all contractors between rate book years 1993 to 1994. These fluctuations are discussed in detail below.

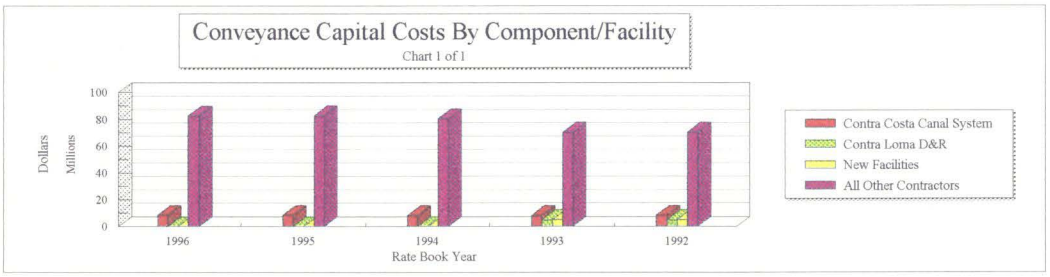
Storage Capital Costs:

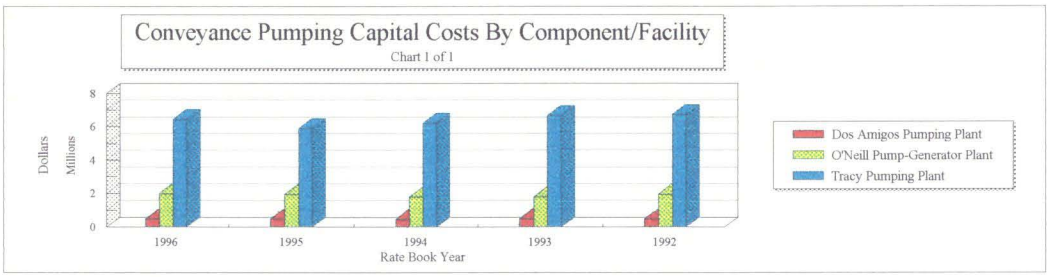
Our analysis indicated a significant increase in storage capital costs allocated to all contractors of approximately $6.5 million between the 1994 and 1995 rate book years. Although the majority of this increase resulted from an approximately $4.5 million increase in Sly Park Dam and Reservoir M&I capital costs, the pooling of these costs results in an increase in the overall storage capital rate paid by all contractors. Total costs of the Sly Park Dam and Reservoir facility did not change. However, the portion of these costs allocated to M&I in 1995 increased from 12.5% to 78.26% while the portion allocated to irrigation decreased by the same proportion. This change in allocation occurred upon the renewal of Eldorado Irrigation District's contract, and was made in order to reflect actual water usage by the District. Additional storage capital costs increases occurred at Sugar Pine Dam and Reservoir and B.F. Sisk San Luis Dam. The increase in Sugar Pine Dam and Reservoir costs was approximately $1.6 million and appears to be due to a shift from irrigation water usage to M&I water usage similar to the shift that occurred at Sly Park Dam and Reservoir. Because of the way the Bureau applies the latest CVP allocation factors to all years, the effect of the Sly Park and Sugar Pine changes is to retroactively allocate more capital costs to M&I and less to Irrigation. This approach treats the new allocation factors as if they had been appropriate for all years since the inception of the project. The Bureau specifically noted that the previously-described revision of projected water deliveries for south-of-delta contractors shifted costs to the M&I function away from irrigation. The increase in B.F. Sisk San Luis Dam capital costs was attributed to an overall increase of $11.7 million in plant-in-service costs reflected in the 1995 ratesetting

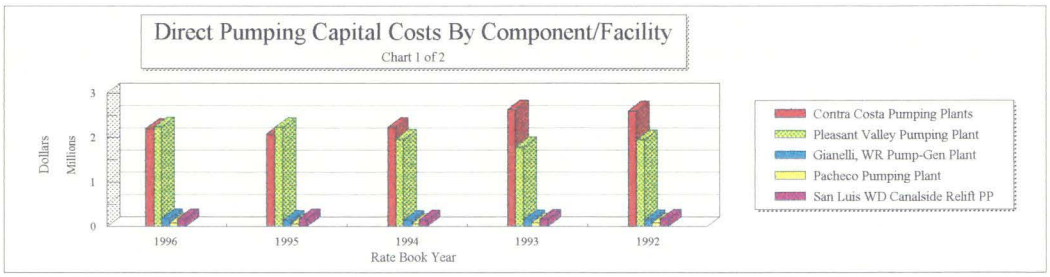
FIGURE 1: COMPARISON OF CAPITAL COSTS BY COMPONENT/FACILITY

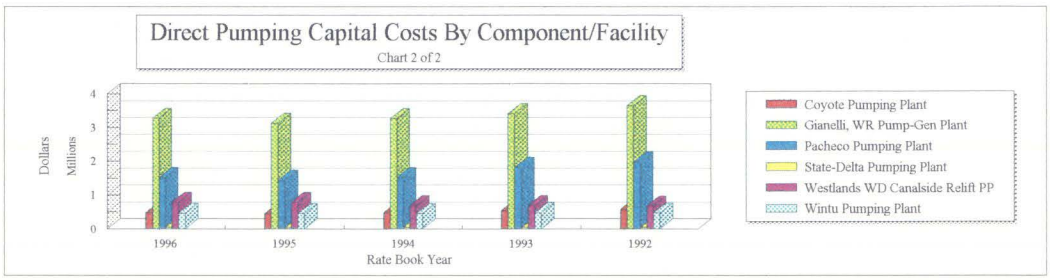












process of which M&I's share was $0.8 million. The increase in total B.F. Sisk San Luis Dam plant-in-service costs was attributable to approximately $8.1 million in general construction and $3.6 million in O&M construction costs that were transferred to plant-in-service beginning in rate book year 1995 (reflects plant-in-service costs as of September 30, 1993). The overall impact of these capital costs increases on the M&I capital rate component is approximately $0.65 per acre-foot, and is illustrated in **Figure 3**. Additional increases and decreases in storage capital costs were noted; however, they were individually insignificant.

Conveyance Capital Costs:

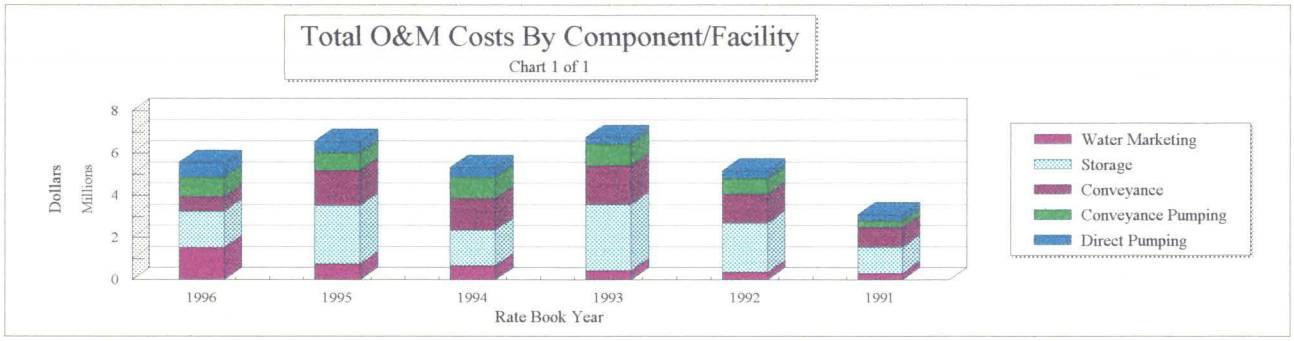
We noted a significant increase in conveyance capital costs of approximately $10.3 million between the 1993 and 1994 rate book years. Upon further investigation, we determined that the main cause for this increase was due to $4.9 million in Contra Loma D&R capital costs and $5 million in New Facilities capital costs. These facilities had been placed on separate repayment contracts billable directly to Contra Costa, but were also being erroneously included in the general conveyance capital cost pool recoverable from all other contractors. This error resulted in an overstatement of the conveyance capital rate in the 1994, 1995, and 1996 rate books of approximately $1.15 per acre-foot, and is illustrated in **Figure 3**. This error only affected contractors who paid cost of service rates for the 1994, 1995, and 1996 rate book years and had a conveyance capital component. Due to the method by which revenues are applied to actual expenses by the Bureau, any amounts over billed under this component would have been applied first to annual O&M expense, secondly to annual interest expense, and then to capital. It is possible that overpayment of conveyance capital facilities occurred and that additional credit is due. The Bureau does not anticipate the need for a retroactive adjustment or refund of any overpayment. The Bureau has since corrected this error and the 1997 rate books will reflect the revised conveyance capital rate and amounts due.

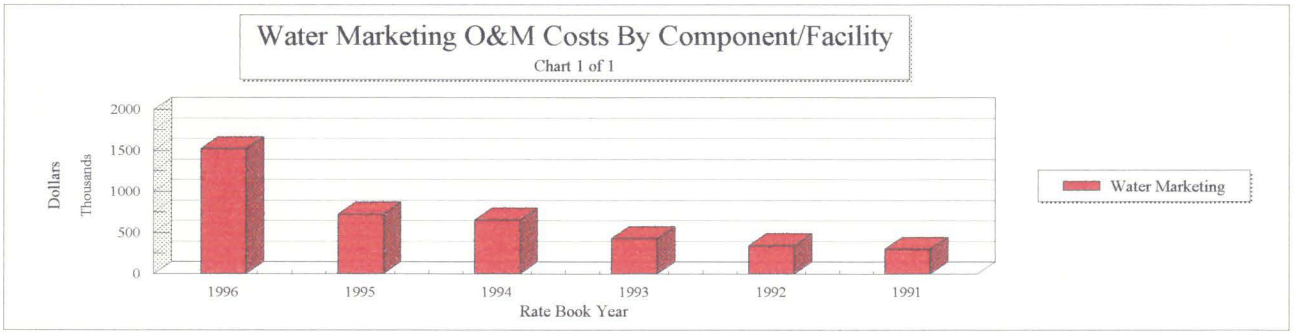
Comparison of O&M Costs by Component/Facility and Impact on Water Rates

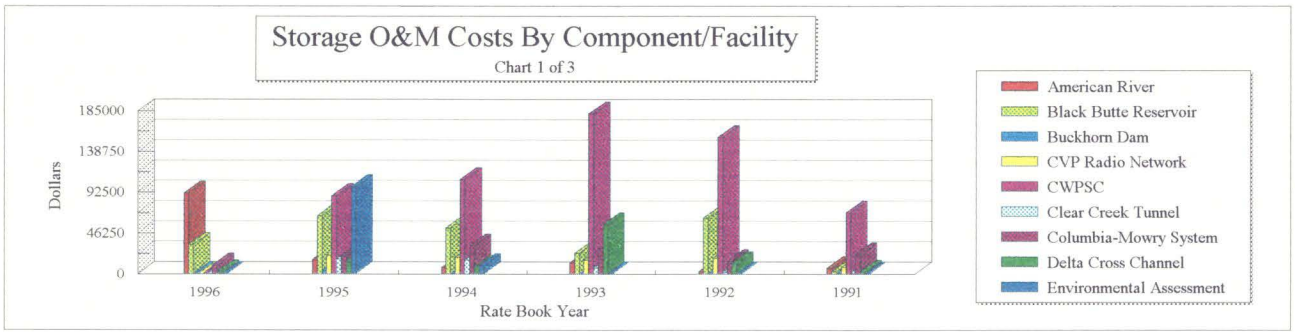
Figure 2 illustrates the changes in O&M costs by component and by facility that have occurred over the six year period from rate book year 1992 through 1996. O&M costs for 1996 are based on projections, while 1991 through 1995 O&M costs are based on actual operating results. The purpose of this analysis was to compare the projected O&M costs used in preparation of the 1996 M&I rate book to actual operating results for the past five years in order to determine the reasonableness of the 1996 O&M rates, and to examine any significant or unusual fluctuations.

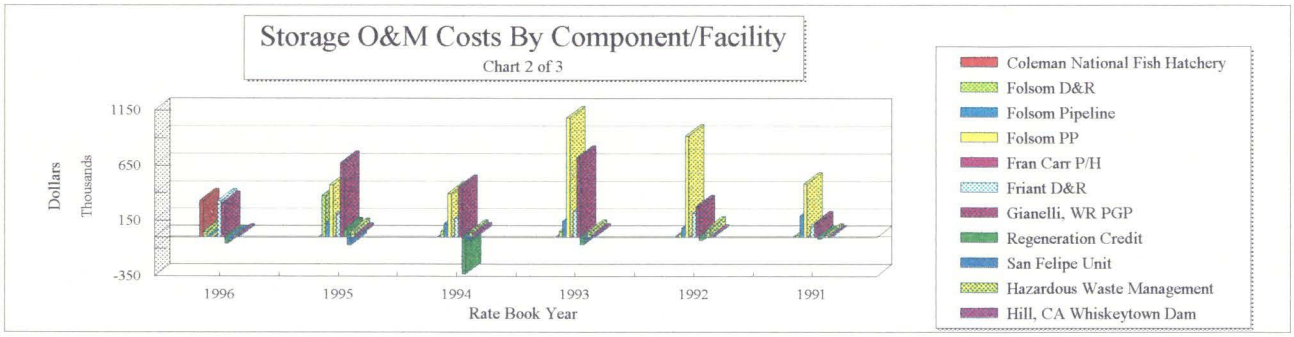
Our analysis indicates that O&M costs of specific rate components fluctuate from year to year making it difficult to prepare accurate projections for use in the ratesetting process. However, since the Bureau operates on an appropriations budget, it tends to end the year quite close, in total, to its Congressional appropriation. This generally means that if unforeseen expenditures are required in one area, say for unplanned maintenance, then costs will have to be reduced in other areas that year to compensate. This is illustrated by comparing the Total O&M Costs by Component/Facility at the top of **Figure 2** to the Trend Analysis-O&M Component in **Figure 3** (note: Figure 3 presents water rates; therefore, the O&M trend presented there is based on projected O&M costs). The trend between actual O&M costs by component/facility closely approximates the trend in the projected O&M rates presented in **Figure 3**, with the exception of 1994. In that year, the Bureau had projected costs to decrease, but the actual costs increased.

FIGURE 2: COMPARISON OF O&M COSTS BY COMPONENT/FACILITY









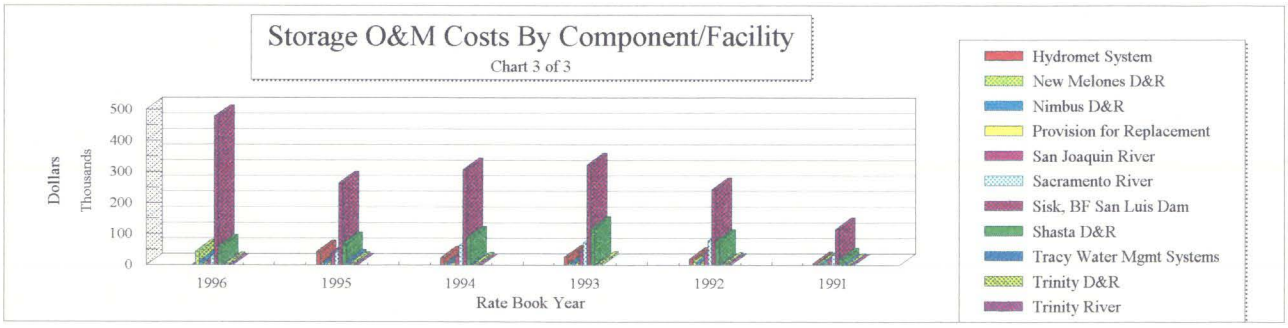
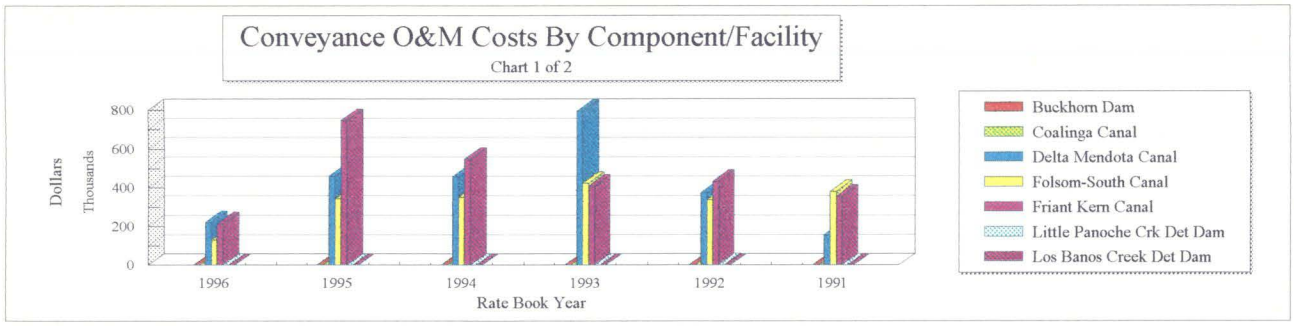
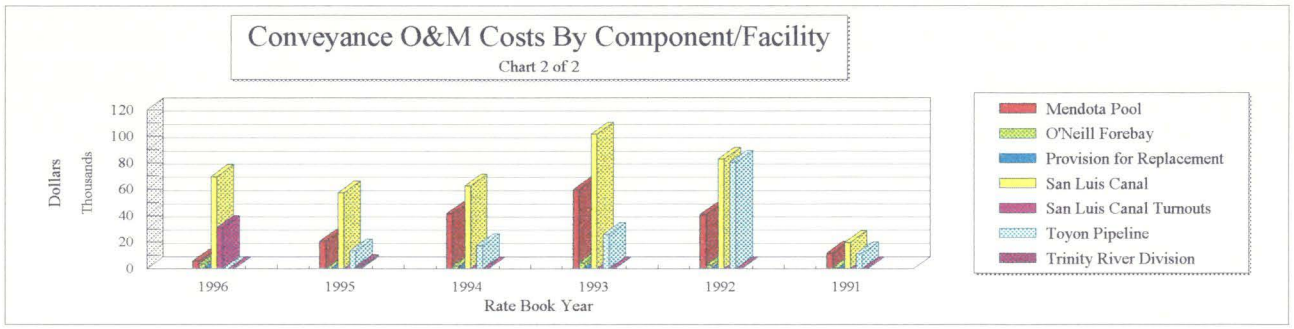
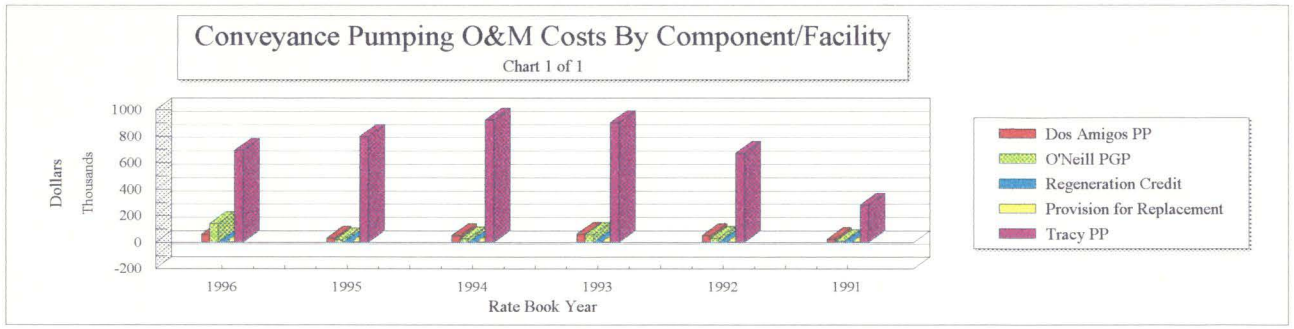
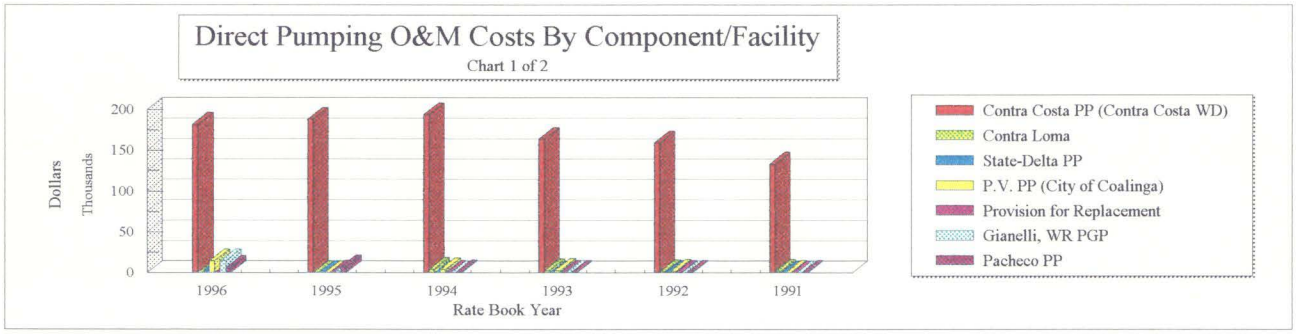


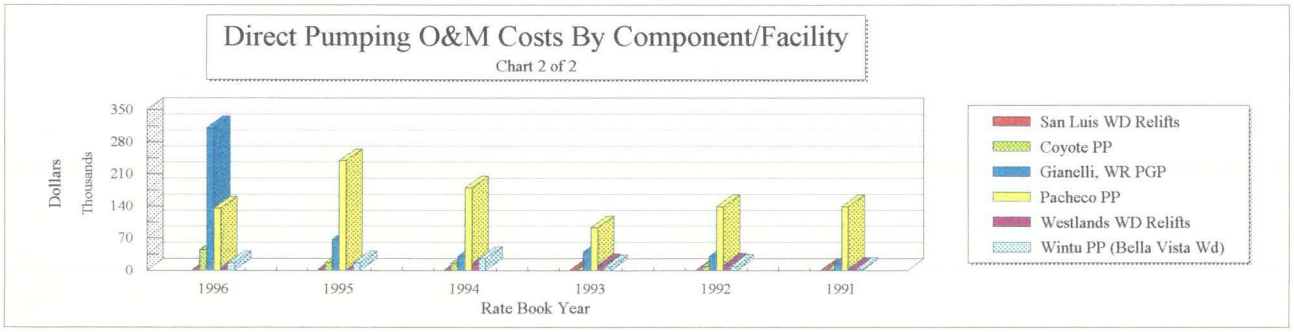
FIGURE 2: COMPARISON OF O&M COSTS BY COMPONENT/FACILITY
(CONTINUED)











While O&M costs in total seem to be consistent, individual components vary widely, both from year to year and between budget and actual. This is particularly true for the storage, conveyance, and water marketing components. The storage component, for example, appears fairly static in the projected O&M water rates illustrated in **Figure 3**; however, as can be seen in **Figure 2**, the actual costs have varied significantly from year to year. The conveyance component, on the other hand, exhibits an inverse relationship between the projected amounts illustrated in the rates in **Figure 3** and the actual costs incurred in **Figure 2**. For example, the projected O&M water rates indicate an increase in the conveyance component from 1993 to 1994, and a decrease in the conveyance component from 1994 to 1995; however, actual conveyance O&M costs decreased from 1993 to 1994, and increased from 1994 to 1995 (an inverse relationship). When actual operating results by component differ significantly from the projected O&M component costs (reflected in the water rates), the contractors' net positions are affected. This occurs because revenues, against which actual operating costs are applied, are determined using actual water deliveries and the water rates in effect during the period (or contract rate where applicable).

The Bureau is aware of the complexitities involved in accurately projecting O&M costs to be used in the ratesetting process. Beginning in 1996, the Bureau began using a new budgeting process known as the O&M Workplan method. The Workplan Method uses a "bottom-up" budgeting approach, contrasted with "top-down" techniques that were previously used. The Bureau believes the new forecasting method should improve the correlation between projected and actual O&M costs by component.

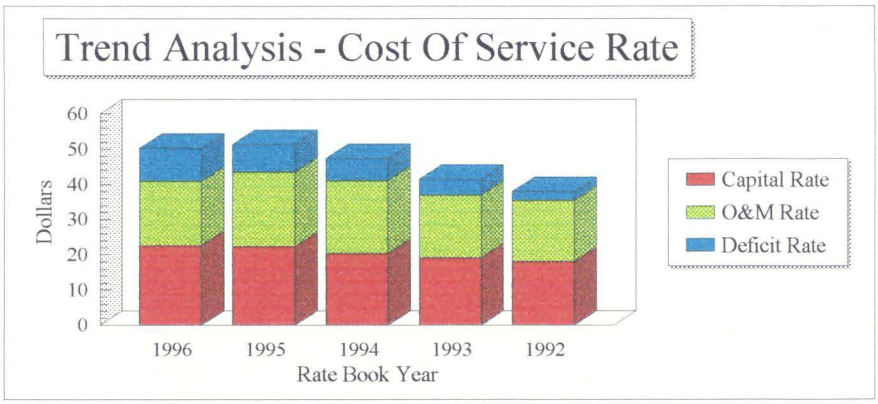
It should be noted that the Bureau is currently developing procedures that would make the individual water authorities responsible for not only performing O&M on the conveyance and conveyance pumping facilities as they are currently doing, but also, for collecting the funds necessary to pay for this O&M. This will eliminate the conveyance and conveyance pumping O&M components of the Bureau's water rates, with the exception of the Red Bluff Diversion Dam and the Folsom South Canal (only contractors utilizing these facilities would be assigned these components of the O&M rate).

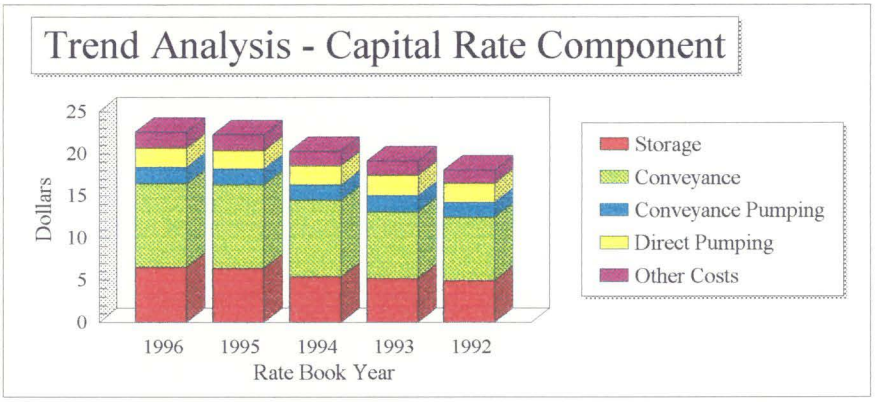
As previously mentioned, the most significant fluctuations in the O&M component rates occurred in the water marketing, storage, and conveyance components. Following is a discussion of the more significant fluctuations within these components:

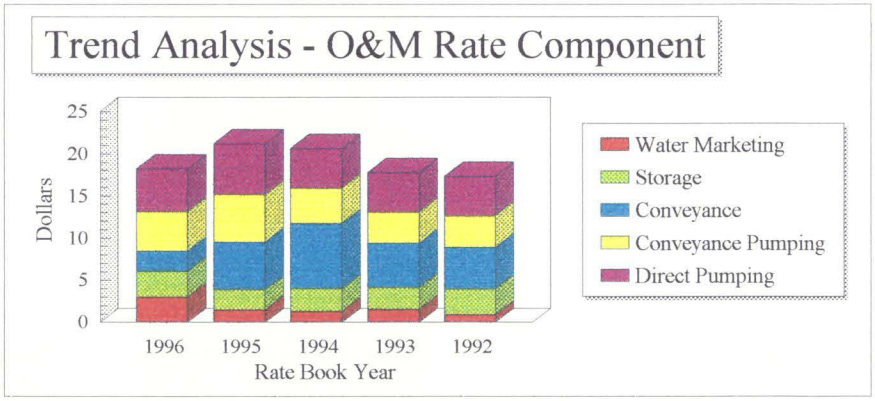
Water Marketing O&M Costs:

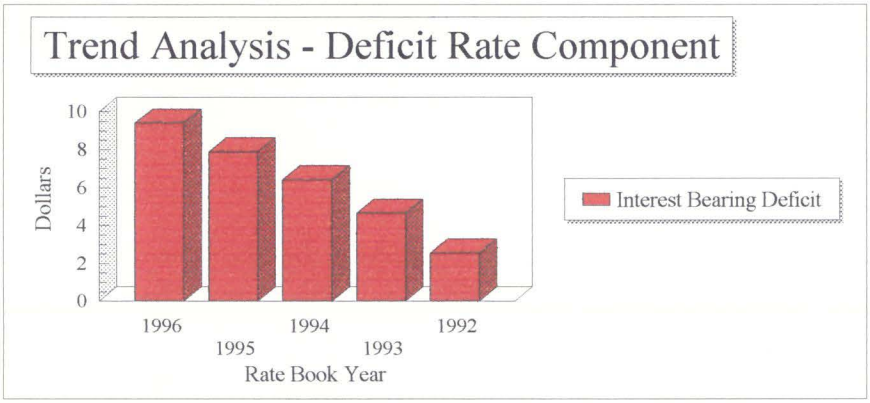
We noted a significant increase in the amount of water marketing costs projected for 1996 from prior year actual and prior year budgeted (which are not presented graphically). The Bureau has projected $1.5 million in water marketing costs for 1996, an increase of $750,000 over the prior year. A large portion of the increase, $260,000, is attributable to anticipated increases in administrative costs associated with a large number of expected contract renewals in 1996. Additionally, $250,000 in CVPIA O&M costs have been added to the 1996 projections consisting mainly of $202,000 in specific cost for marketing water supplies to be repaid by all water users under the CVPIA. Projections for water and power systems control O&M costs increased $240,000. The main reasons for this increase are the reclassification of $50,000 in Central Water and Power System Control (CWPSC) O&M costs from storage to water marketing, and the inclusion of $190,000 in power resource management, system control/load dispatching, and water operations costs previously not budgeted for under the old O&M budgeting system.

FIGURE 3: TREND ANALYSIS BY RATE COMPONENT









Note: These charts use Santa Clara Valley Water District data as illustrative of rate patterns applicable to all contractors.

Storage O&M Costs:
There were numerous fluctuations in the storage component. Some of the more significant ones are as follows:

American River - Sugar Pine Dam and Reservoir is projected to incur $83,615 in O&M costs in 1996, which is a significant increase over prior years. Our evaluation of the O&M cost allocations indicates this projection is for normal O&M that was deferred in prior years, and is based on projections generated using the new O&M Workplan budgeting methodology.

Environmental Assessment - These were one-time costs of $110,000 incurred mainly in 1995 to perform preliminary work for the Programmatic Environmental Impact Study. These preliminary costs were expensed in the year incurred unlike the costs of the actual study, which were capitalized.

Central Water and Power System Control (CWPSC) - These costs are not budgeted in the 1996 storage O&M component, as the Bureau has reclassified them to the water marketing O&M component beginning in 1996. The Bureau has projected $50,000 for CWPSC O&M for 1996.

Folsom Pumping Plant - Significant O&M costs ranging from $400,000 to over $1 million in 1993, were incurred in 1991 through 1995 due to work performed to replace pumps and modify the intake so that water could be pumped during periods when lake water levels are down. This work has now been completed.

Regeneration Credit - The regeneration credit of $334,000 posted in 1994 reflects a Bureau estimate for the last two months of the year. When actual results for 1994 became known by the Bureau, an adjustment was made to adjust the credit to actual; however, the adjustment was posted to 1995, which resulted in a net regeneration charge for that year. The Bureau has since adopted a revised method for estimating the amount of this credit and expects future fluctuations in this component to be minimal.

San Luis Dam - The increase in 1996 projected O&M costs of $214,000 appears to be due to increased normal O&M maintenance forecasted using the new O&M Workplan budgeting method. Additionally, the M&I allocation percentage changed from 15% in 1995 to 29% in 1996. The change in this allocation percentage was below the scope of our evaluation and was not further pursued.

Conveyance O&M Costs:
We noted significant fluctuations in two of the conveyance O&M facilities. These fluctuations are as follows:

Delta Mendota Canal - 1993 O&M costs significantly increased as a result of work performed to resurface O&M roads and repair the Tracy Water Management System.

Friant Kern Canal - Although total O&M costs for the Friant Kern Canal have remained fairly stable, the portion of these costs allocated to M&I increased in 1994 and 1995, while the portion allocated to agricultural water contractors decreased over this same period, indicating a shift of project water usage toward M&I. The projected decrease in 1996 O&M costs allocated to M&I is indicative of an overall decrease in projected O&M for the Friant Kern Canal.

Comparison of Water Delivery Data Used in the Ratesetting Process Between 1995 and 1996

The two focal points of the ratesetting process are costs and water deliveries. This section of our report analyzes water deliveries that were used in the 1995 and 1996 rate books.

Figure 4 provides a comparison of the historical and projected water deliveries for the period 1981 through 2030 used to determine the unpaid capital rate by component, by facility, for the 1995 and 1996 rate books (the rate determined at this stage of the ratesetting process does not reflect interest on the unpaid capital balance). Our analysis indicates that these water deliveries changed very little between 1995 and 1996, and, therefore, did not significantly contribute to any of the capital cost fluctuations previously discussed.

Figure 5 provides a comparison of historical and projected water deliveries for the period 1981 through 2030 used to allocate unpaid capital costs among the M&I water contractors for the 1995 and 1996 rate books. Our analysis indicates that water deliveries used in this allocation remained virtually unchanged between 1995 and 1996; therefore, they did not significantly affect the allocation of these costs.

Figure 6 provides a comparison of the present worth of projected water deliveries for the periods 1995 - 2030 and 1996 - 2030 used in the determination of the capital rates by facility, by contractor, for the 1995 and 1996 rate books, respectively (the rates determined at this stage of the ratesetting process now reflect interest on unpaid capital costs). Our analysis indicates very little change in the present worth of the water deliveries used in the determination of these rates, and, therefore, did not significantly contribute to any of the capital cost fluctuations previously discussed.

Figure 7 provides a comparison of the projected water deliveries for 1995 and 1996 used in the determination of the O&M rate components by facility, by contractor, for the 1995 and 1996 rate books, respectively. Our analysis indicates that these projected water deliveries did not materially affect the determination of these rates.

FIGURE 4
COMPARISON OF HISTORICAL AND PROJECTED WATER DELIVERIES BY COMPONENT/FACILITY

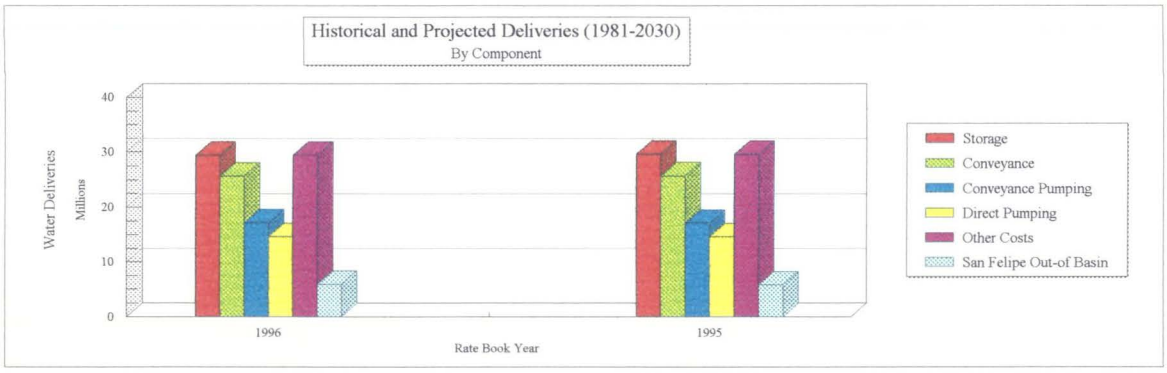
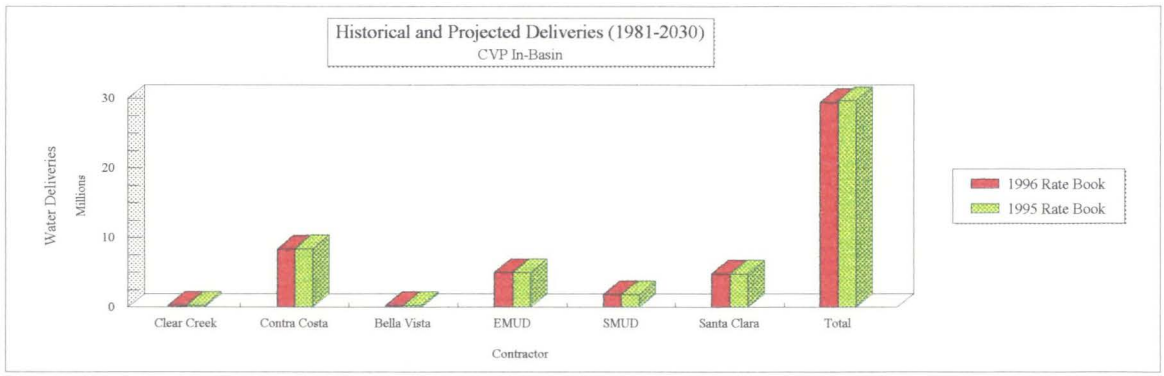


FIGURE 5
COMPARISON OF HISTORICAL AND PROJECTED WATER DELIVERIES BY FACILITY/CONTRACTOR



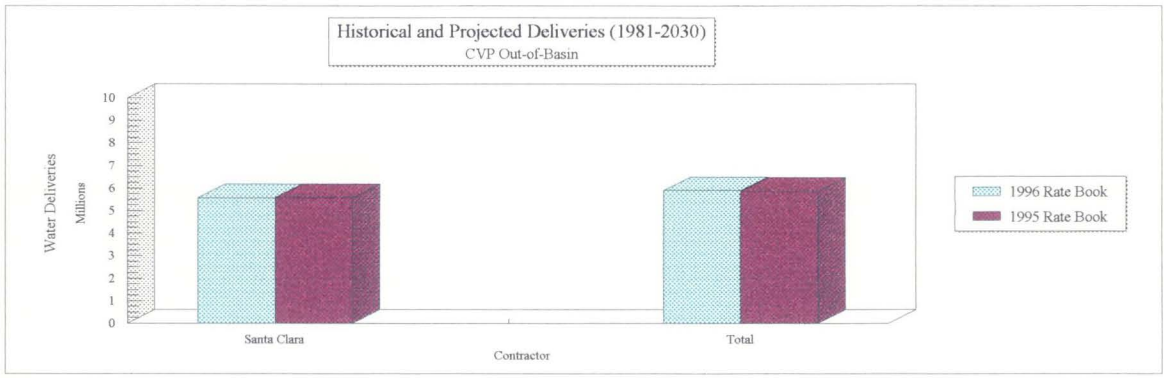


FIGURE 6
COMPARISON OF PRESENT WORTH OF PROJECTED WATER DELIVERIES BY FACILITY/CONTRACTOR

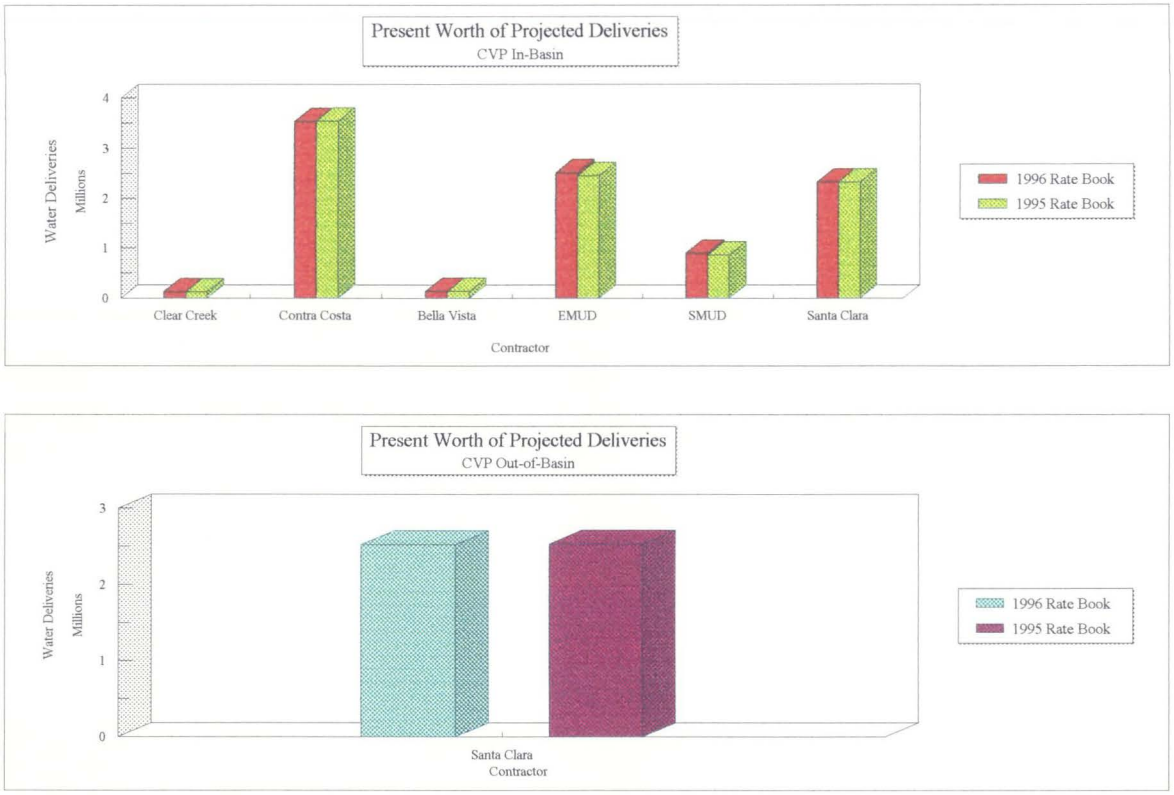
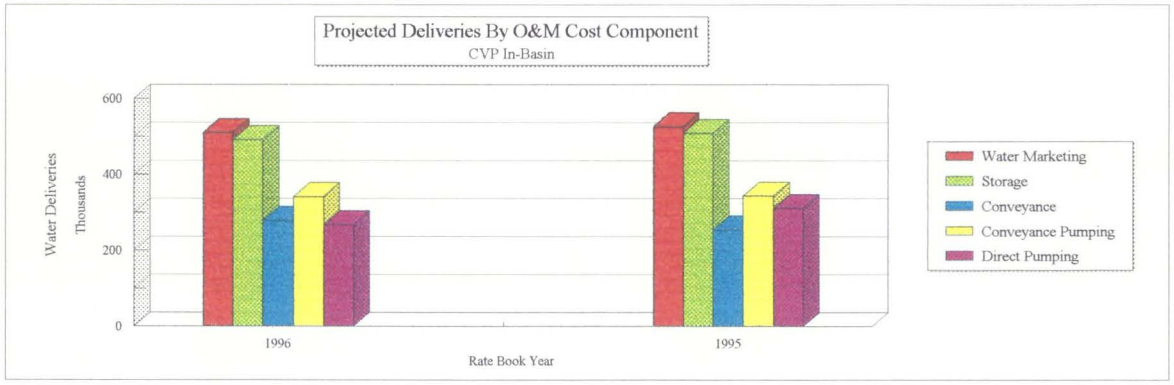


FIGURE 7
COMPARISON OF PROJECTED WATER DELIVERIES BY FACILITY/CONTRACTOR



Contractor Specific Issues

Verification of Water Delivery and Payment Data

In order to verify the accuracy of the data recorded in the Bureau's '705' system, one of the input sources into the ratesetting process, we obtained water delivery and payment data from each of the seven participating water contractors for the Bureau's 1993/94 fiscal year (reflected in the 1996 rate books). We traced this data into the '705' system, and in most cases, were able to agree the contractor's data to the '705' system. In a few instances, we received incomplete data from the contractors or the data received was in a format significantly different from that of the '705' system making verification impractical.

Most of the differences noted during the verification process pertained to immaterial rounding errors; however, we did note several significant input errors that we brought to the Bureau's attention. The Bureau agreed with our findings and has since corrected or is in the process of correcting these errors. Specifically, we noted the following errors:

SMUD:
The Bureau's records indicated a $300,000 payment by SMUD that SMUD did not make. According to SMUD, this was to be corrected in May 1995. The Bureau was able to provide us with documentation indicating that an adjustment had been made in the '705' system to correct this error.

Santa Clara Valley Water District:
Santa Clara Valley Water District's records indicated M & I water deliveries for the month of August 1994 in the amount of 10,842 acre-feet. The '705' system indicated that M & I water deliveries for August 1994 were 10,892 acre-feet. This represents a potential additional charge of approximately $4,000 to the District. The Bureau is in the process of correcting this error.

Placer County Water Agency:
Placer County Water Agency's records indicated that they did not use any Project water for M&I purposes during 1994; however, the '705' system had recorded 7,950 acre-feet of M&I water during that period, which represents a potential additional charge of approximately $55,000. The Bureau is in the process of correcting this error.

Only one of the seven participating contractors, Bella Vista Water District, made a voluntary payment during the Bureau's 1993/94 fiscal year. Voluntary payments are not recorded in the '705' system; therefore, we traced this payment directly into the ratesetting spreadsheets without exception.

In addition to verifying the contractors' water delivery and payment data, we inquired of the Bureau as to the status of Bureau's reconciliation of the contractor's advance payment accounts. The Bureau commented that they have assigned personnel to perform this task and will begin the process in the near future.

Evaluation of Change in Contractor Deficits

We evaluated the change in the deficit (i.e., net position) for each contractor for 1994 (the year on which the 1996 deficit rates are based) in order to determine that any additional deficit, or reduction, was determined in accordance with Bureau policy and reflected in the calculation of the 1996 deficit rate. A contractor's net position is determined for ratesetting purposes by applying their allocated share of annual O&M expense and interest expense against their computed annual revenues (determined as the contractor's water deliveries times the applicable water rate), taking into consideration any voluntary payments made by the contractor during the year.

Our evaluation involved reconciling contractor revenues recorded in the '705' system to those reflected in the ratesetting spreadsheets, reconciling total O&M expense recorded in the CVP financial statements to those reflected in the ratesetting spreadsheets, and testing the clerical accuracy of the underlying computations. We then traced the net positions into the deficit rate computation spreadsheet.

Based on the procedures performed, it appears that the Bureau has determined the net positions of the water contractors for Bureau fiscal year 1993/94, and reflected these net positions in the deficit rate computation for the 1996 rate books in accordance with the ratesetting policy.

Evaluation of Water Transfers

Of the participating contractors, Santa Clara Valley Water District was the only one which had any water transfers during the period under evaluation. We determined that these transfers were properly recorded in the '705' system. Additionally, we determined that the water rates pertaining to these water transfers were in accordance with Part E "Transferred Water Rates" of the Revised Interim Guidelines, Restoration Fund Payments and Charges. Those guidelines require that the contractor shall pay the higher of the transferee or transferor's rates. In this case Santa Clara Valley Water District paid for the water at their rate, which was the higher rate.

Special Aspects

Evaluation of the Interest Calculation Methodology

The interest charges on O&M deficits and capital costs are currently computed using the methodology outlined in the Proposed M&I Interim Ratesetting Policy. According to the Bureau's policy, as outlined in this document, *Annual O&M costs, including interest on unpaid capital and deficits, which are not repaid within the year incurred, become deficits and must be repaid with interest.* This policy is applied in the ratesetting process by including unpaid annual interest, including the unpaid interest on capital costs, in the O&M deficit.

The rationale used by the Bureau in adding unpaid interest on capital costs to the O&M deficit balance is based on their interpretation of Section 106 of Public Law 99-546, which read as follows (see footnote 4 for full text of Section 106)."

> *"The Secretary of the Interior shall include in each new or amended contract for the delivery of water from the Central Valley project provisions ensuring that any annual deficit (outstanding or hereafter arising) incurred by a Central Valley project water contractor in the payment of operation and maintenance cost of the Central Valley project is repaid by such contractor under terms of such new or amended contract...."*

The ratesetting policy defines "Cost of Service" as including "recovery, within the authorized repayment period, of: (1) annual O&M costs, (2) interest costs, (3) M&I investment costs, and (4) any individual contractor deficit balances." The ratesetting policy does not separately define O&M interest and interest on unpaid capital. All interest, including interest calculated on unpaid capital costs is added to the O&M deficit balance.

According to the ratesetting policy, the interest rate on unpaid capital is a composite interest rate developed by weighting each of the authorized project interest rates by the expenditures to date for the in-service facilities, and is currently about 2.8 percent.

The interest rate on individual contractor O&M and unpaid capital interest deficits is based on separate interest rate criteria applicable to three periods: 1949-1976, 1977-1985, and 1986-present. The ratesetting policy describes the interest rate for each of the three periods as follows:

Deficit Interest 1949-1976:
The project unpaid plant investment interest rate is applied to all O&M and unpaid capital interest deficits incurred during this period. The rates used during this period were comprised of a specific rate of 2.5 percent for the period 1949-1973 and gradually increased to a composite rate of 2.654 percent by 1976.

Deficit Interest 1977-1985:
We were informed by the Bureau that in 1977 they began applying annual Project power repayment interest rates to future M&I deficits. Given this second interest rate criteria, a composite deficit interest rate was computed to reflect the weighting of the annual deficits and applicable interest rates.

Deficit Interest 1986-Present:
In 1986, the 1977 instructions were superseded by the enactment of Public Law 99-546 (1986 Coordinated Operation Agreement). Section 106 of that law provides for the application of an annually updated Federal interest rate to all annual O&M deficits incurred by Project contractors. Annually, each contractor's composite deficit interest rate is updated for new O&M deficits incurred at the applicable Section 106 deficit interest rate.

The methodology for determining the O&M interest rate results in a substantially higher rate than the capital interest rate. Therefore the inclusion of unpaid capital interest in the O&M deficit balance results in the higher rate, being applied to this unpaid capital interest.

The federal interest rate applied to the O&M deficit is weighted annually, for each contractor, by the amount of deficit calculated for that contractor for that year. As a result, the weighted interest rate (referred to as a composite interest rate) is different for each contractor, for all years after 1974.

Interest on out-of-basin capital costs is calculated separately from in-basin costs. It is determined for each out-of-basin contractor by reducing their allocated capital amount by any payment, and then multiplying this amount by the applicable interest rate, which ranges from 3.137% - 3.5%.

We tested the Bureau's calculations reflected in the 1996 rate books by recomputing the yearly capital and O&M deficit interest, by contractor, using the interest rates per the 1996 Water Rate Book. The deficit balance was recomputed by adding the Bureau's calculated interest to the computed O&M and unpaid capital interest yearly deficit and then adding this amount to the prior year's total deficit balance.

The outstanding O&M and unpaid capital interest deficits and applicable interest rates as of September 30, 1994 are as follows:

	Total O&M and unpaid Capital Interest Deficit[9]	Interest Rate[10]
Bella Vista Water District	$ 1,097,837	7.97%
Clear Creek Conservation District	318,121	7.12
Contra Costa Water District	23,170,236	7.14
East Bay Municipal Utility District	19,083,582	8.51
Sacramento Municipal Utility District	6,810,775	8.37
Santa Clara Valley Water District - In-Basin	11,346,469	8.23
Santa Clara Valley Water District - Out-of-Basin	41,838,110	8.34

9 1996 Municipal and Industrial Water Rates, Schedule A-6.

10 1996 Municipal and Industrial Water Rates Volume 2, Calculation of M&I Net Position for each contractor.

Except for a few minor differences, we were able to verify the Bureau's calculations of interest on capital balances for all in-basin contractors. We were unable to verify 1993 and 1994 out-of-basin interest using the method described by the Bureau.

Based on our analysis, it appears that the interest rate methodology used in the determination of the 1996 water rates is consistent with prior years and in accordance with the Bureau's ratesetting policy.

Alternative Capital Interest Computation

The following analysis contrasts the Bureau's current policy with two alternative approaches.

The first alternative is to accrue interest on unpaid capital interest at the capital interest rate of 2.8% and on unpaid O&M deficit at the O&M deficit interest rate applicable to each contractor. In applying this method, we created two separate contractor obligations, one for O&M deficits including interest thereon, and one for unpaid capital interest with additional interest compounded annually. If this approach resulted in an O&M surplus for the year then the surplus was applied to unpaid capital interest as required by the Proposed M&I Interim Ratesetting Policy.

Under the second alternative, we calculated deficit balances without interest on unpaid capital interest. Capital interest and the O&M deficit were separated, and interest was calculated on the accumulated operating deficit only.

Figure 8 illustrates the results of our analysis. Under both alternatives, the resulting O&M deficit balance, if applicable, and the unpaid capital interest balance when combined, were significantly less than the Bureau's calculated O&M deficit for the same period. Indeed, without capital interest in O&M, there generally was not a deficit, but a surplus.

We also projected the O & M deficit balances and Unpaid Capital Interest balances through 2004 for each of the participating contractors. The results of these projections are illustrated in the appendix of this report. The differences at that point are even more dramatic and show graphically the acceleration of the deficit balance due to unpaid interest.

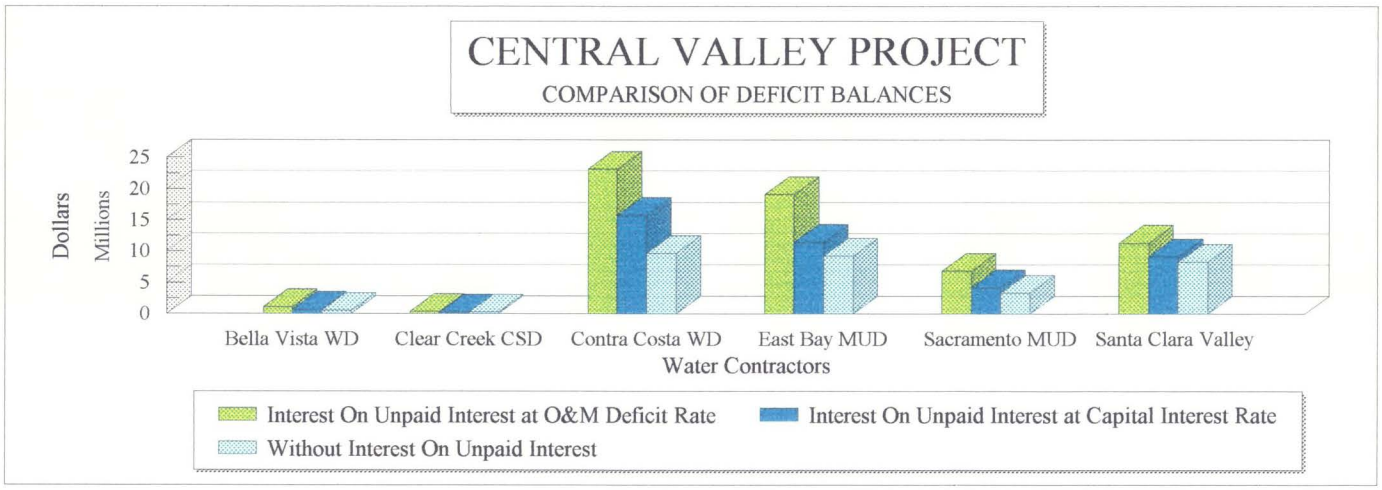
Evaluation of the Plant-In-Service Cost Allocation Used in Preparation of the 1996 Rates

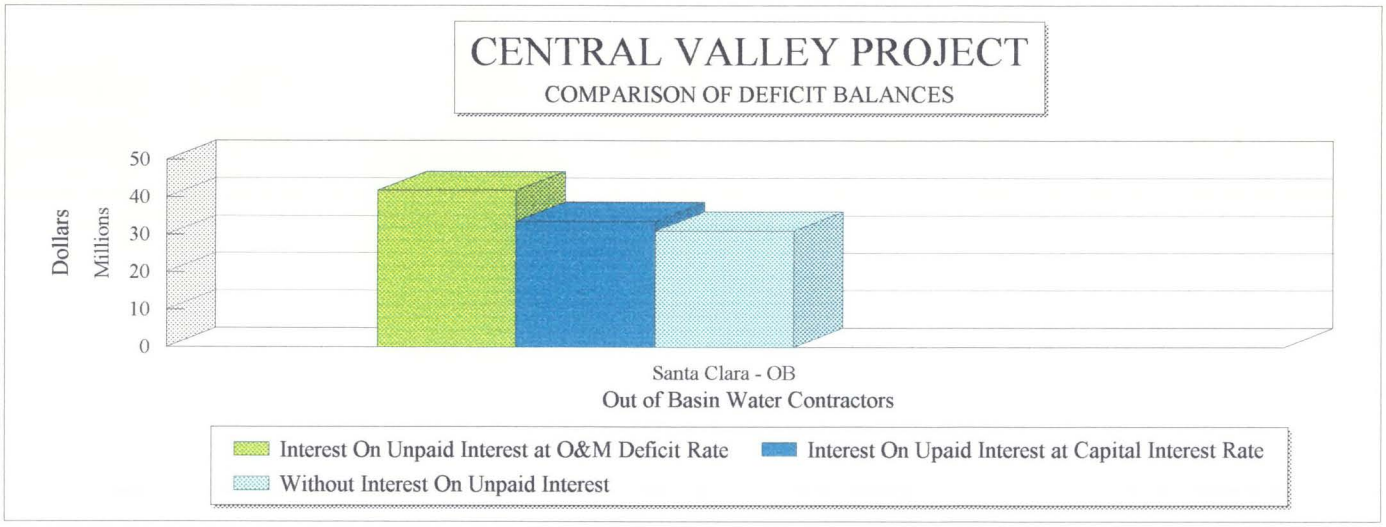
Each year the Bureau performs a Plant-In-Service allocation as a preliminary step in the ratesetting process. The purpose of the allocation is to take plant-in-service costs as reported in the CVP financial statements and allocate them to the project functions (i.e., M&I, Irrigation, Flood Control, Recreation, etc...) and to the cost components (i.e., Storage, Conveyance, Conveyance Pumping, etc...). Costs that are allocated include specific and joint costs for water supply and power facilities. The plant-in-service costs are allocated to the aforementioned project functions and components by division (i.e., American River Division, Delta Division, etc...) based upon allocation factors developed by the Bureau. These allocation factors are based on water and power deliveries and are subject to change.

FIGURE 8: COMPARISON OF DIFFERENT INTEREST RATE METHODOLOGIES

(As of September 30, 1994)

	USBR Current Methodology	Interest on Unpaid Capital Interest at Capital Interest Rate	Without Interest on Unpaid Capital Interest
Bella Vista WD	$1,097,837	$678,333	$490,660
Clear Creek CSD	318,121	266,369	211,584
Contra Costa WD	23,170,236	15,742,191	9,692,772
East Bay MUD	19,083,582	11,489,838	9,233,191
Sacramento MUD	6,810,775	4,163,224	3,303,665
Santa Clara Valley	11,346,469	9,144,329	8,340,064
Santa Clara - OB	41,838,110	33,599,228	30,992,419





We compared the 1993 Plant-In-Service allocation to the 1994 Plant-In-Service allocation, used in preparation of the 1995 and 1996 rate books, respectively, to determine any changes in methodology that would have affected the 1996 capital rates. Our comparison included examining total plant-in-service costs used in the allocation, of those costs among the various CVP functions and components, and the factors underlying the allocation process.

Consistent with our statistical analysis presented earlier that indicated very little change in the capital rates, our evaluation of the 1995 and 1996 Plant-In-Service allocations indicated the methodology used to perform the 1996 Plant-In-Service allocation is consistent with the prior year and that the underlying cost and allocation factors remained virtually unchanged.

Evaluation of the Impact of the CVPIA on Water Rates

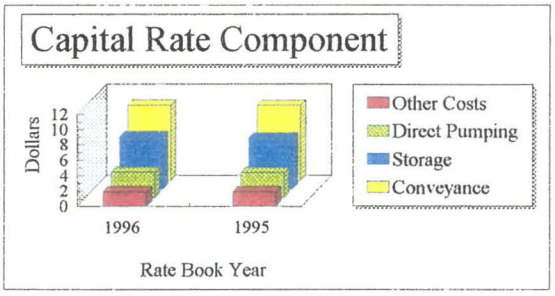
As of the end of our fieldwork, the Bureau had not yet released a current Annual Financial Report for the Central Valley Project Improvement Act (CVPIA). The latest report available covered actual revenues and expenditures for the period October 30, 1992 - September 30, 1993 (No expenditures were incurred during this period). As a result, we were unable to perform an analysis of how CVPIA activities have affected the water rates, with the exception that we noted certain CVPIA O&M costs have been included in 1996 projected Water Marketing expenses. (See page 22 of report.)

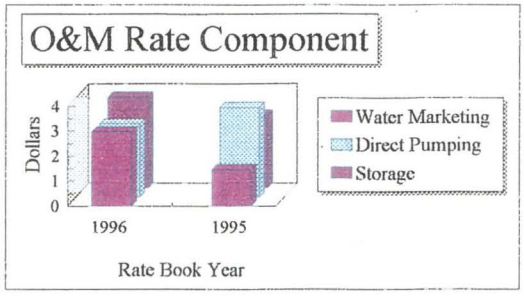
APPENDIX A

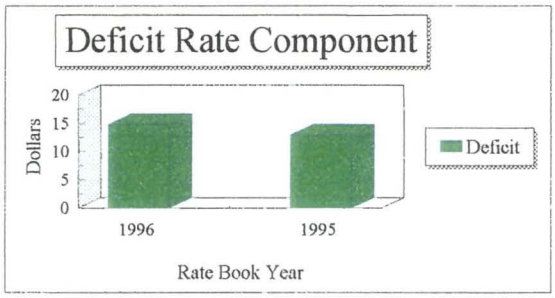
BELLA VISTA WATER DISTRICT

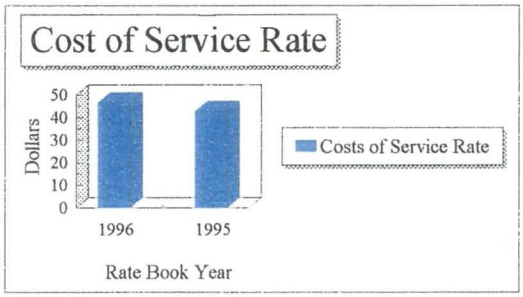
Bella Vista WD
Analysis of changes in water rates between the 1995 and 1996 Rate Books

	Water Rate Year 1996	Water Rate Year 1995	Difference	Percentage Change From Prior Year
Cost of Service Rate				
Capital Rate Component				
Storage	$6.86	$6.69	$0.17	2.5685%
Conveyance	9.85	9.84	0.01	0.1044%
Conveyance Pumping				
Direct Pumping	3.38	3.31	0.07	1.9697%
Other Costs	1.92	1.89	0.02	1.1925%
Total Capital Rate	22.01	21.74	0.27	1.2420%
O&M Rate Component				
Water Marketing	2.98	1.47	1.51	102.7211%
Storage	3.64	2.92	0.72	24.6575%
Conveyance				
Conveyance Pumping				
Direct Pumping	2.94	3.59	2.23	62.1170%
Total O&M Rate	9.56	7.98	4.46	55.8897%
Deficit Rate Component				
Interest Bearing	14.80	12.93	1.87	14.4625%
Total Deficit Rate	14.80	12.93	1.87	14.4625%
Costs of Service Rate	$46.37	$42.65	$6.60	15.4748%



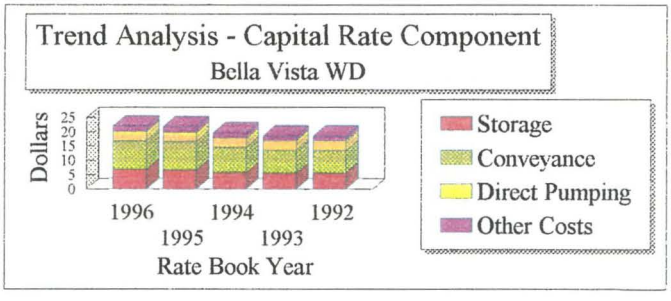


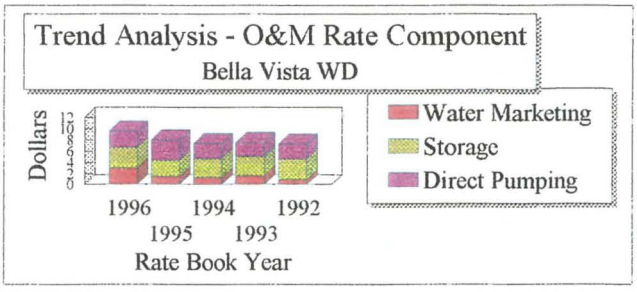


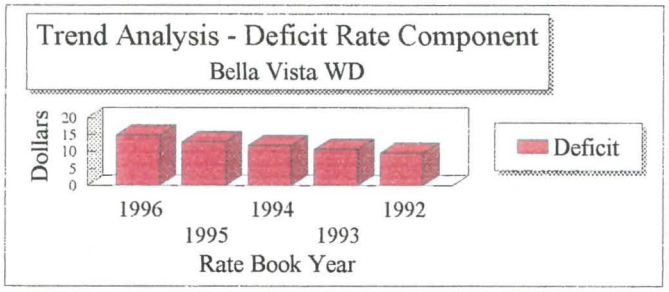


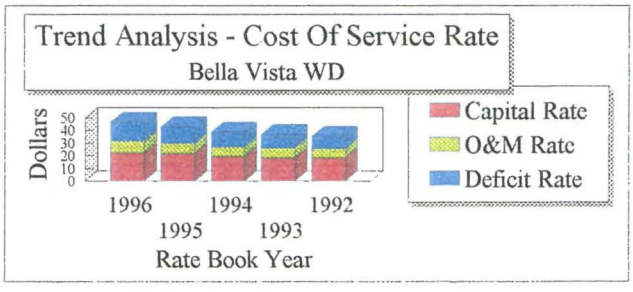
Bella Vista WD
Five Year Trend Analysis for Rate Book Years 1992 - 1996

	1996	1995	1994	1993	1992
Capital Rate Component					
Storage	6.86	6.69	5.63	5.46	5.53
Conveyance	9.85	9.84	8.96	7.87	7.85
Direct Pumping	3.38	3.31	3.33	3.52	3.51
Other Costs	1.92	1.89	1.74	1.67	1.67
	22.01	21.74	19.66	18.53	18.55
O&M Rate Component					
Water Marketing	2.98	1.47	1.31	1.58	0.94
Storage	3.64	2.92	3.31	3.46	3.60
Direct Pumping	2.94	3.59	2.68	2.46	2.67
	9.56	7.98	7.30	7.50	7.21
Deficit Rate Component					
Interest Bearing Deficit	14.80	12.93	11.80	10.72	9.57
	14.80	12.93	11.80	10.72	9.57
Cost of Service Rate					
Capital Rate	22.01	21.74	19.66	18.53	18.55
O&M Rate	9.56	7.98	7.30	7.50	7.21
Deficit Rate	14.80	12.93	11.80	10.72	9.57
	46.37	42.65	38.76	36.75	35.33



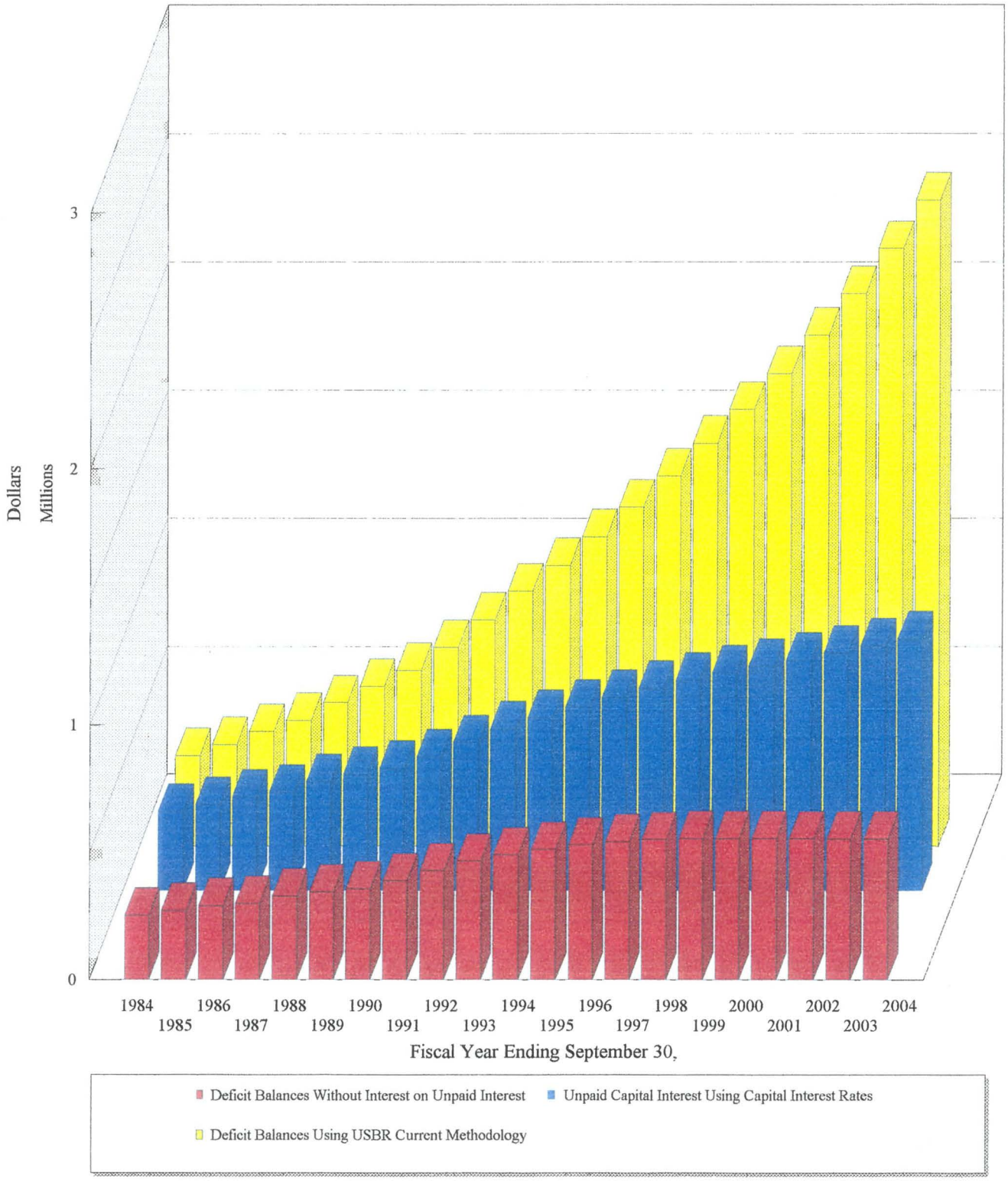






COMPARISON OF DEFICIT BALANCES

USING DIFFERENT METHODOLOGIES



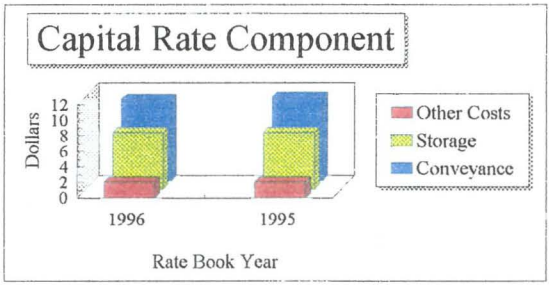
Bella Vista Water District

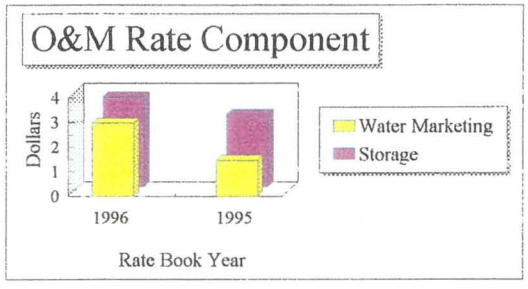
APPENDIX B

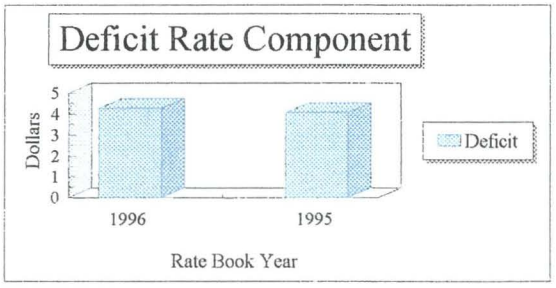
CLEAR CREEK COMMUNITY SERVICES DISTRICT

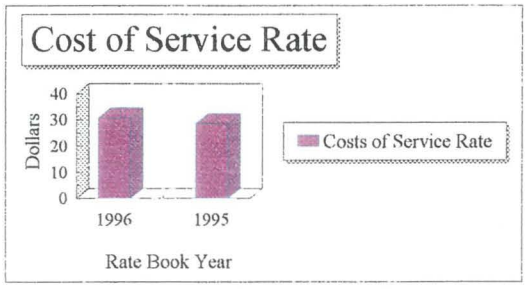
Clear Creek CSD
Analysis of changes in water rates between the 1995 and 1996 Rate Books

	Water Rate Year 1996	Water Rate Year 1995	Difference	Percentage Change From Prior Year
Cost of Service Rate				
Capital Rate Component				
Storage	$7.33	$7.32	$0.01	0.0778%
Conveyance	10.52	10.77	-0.25	-2.3426%
Conveyance Pumping				
Direct Pumping				
Other Costs	2.05	2.07	-0.02	-1.1258%
Total Capital Rate	19.90	20.17	-0.27	-1.3386%
O&M Rate Component				
Water Marketing	2.98	1.47	1.51	102.7211%
Storage	3.64	2.92	0.72	24.6575%
Conveyance				
Conveyance Pumping				
Direct Pumping				
Total O&M Rate	6.62	4.39	2.23	50.7973%
Deficit Rate Component				
Interest Bearing	4.27	4.07	0.20	4.9140%
Total Deficit Rate	4.27	4.07	0.20	4.9140%
Costs of Service Rate	$30.79	$28.63	$2.16	7.5445%



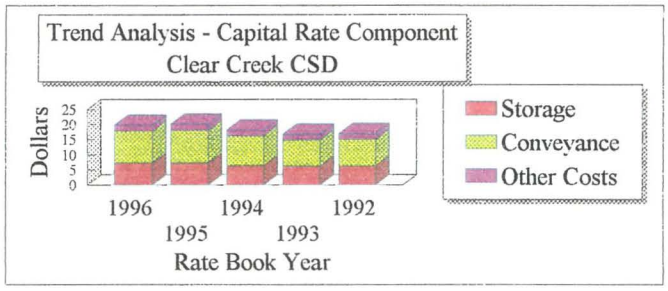


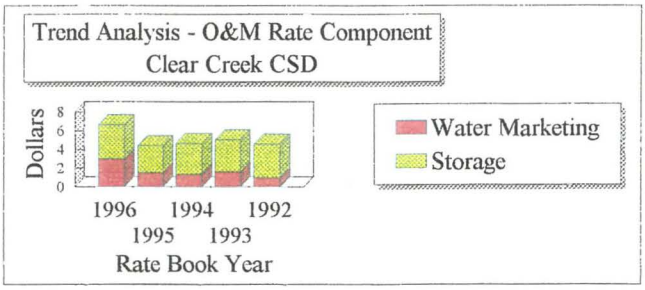


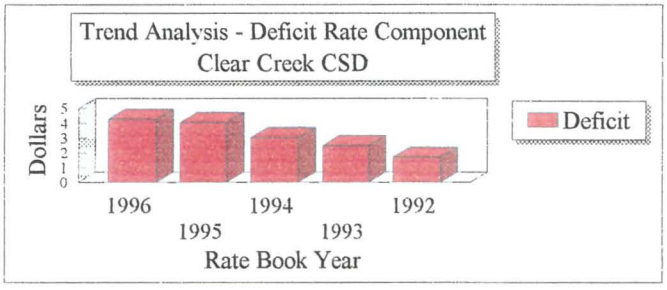


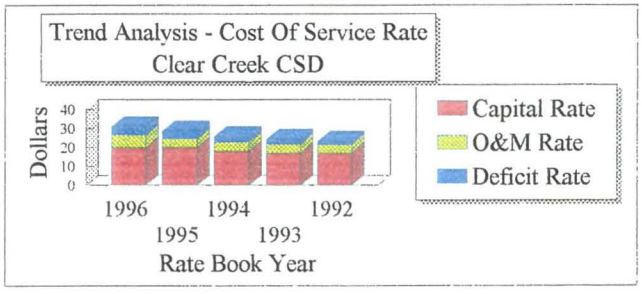
Clear Creek CSD
Five Year Trend Analysis for Rate Book Years 1992 - 1996

	1996	1995	1994	1993	1992
Capital Rate Component					
Storage	7.33	7.32	6.28	6.12	6.24
Conveyance	10.52	10.77	9.98	8.82	8.86
Other Costs	2.05	2.07	1.93	1.87	1.88
	19.90	20.17	18.19	16.81	16.98
O&M Rate Component					
Water Marketing	2.98	1.47	1.31	1.58	0.94
Storage	3.64	2.92	3.31	3.46	3.60
	6.62	4.39	4.62	5.04	4.54
Deficit Rate Component					
Interest Bearing Deficit	4.27	4.07	3.04	2.48	1.70
	4.27	4.07	3.04	2.48	1.70
Cost of Service Rate					
Capital Rate	19.90	20.17	18.19	16.81	16.98
O&M Rate	6.62	4.39	4.62	5.04	4.54
Deficit Rate	4.27	4.07	3.04	2.48	1.70
	30.79	28.63	25.85	24.33	23.21



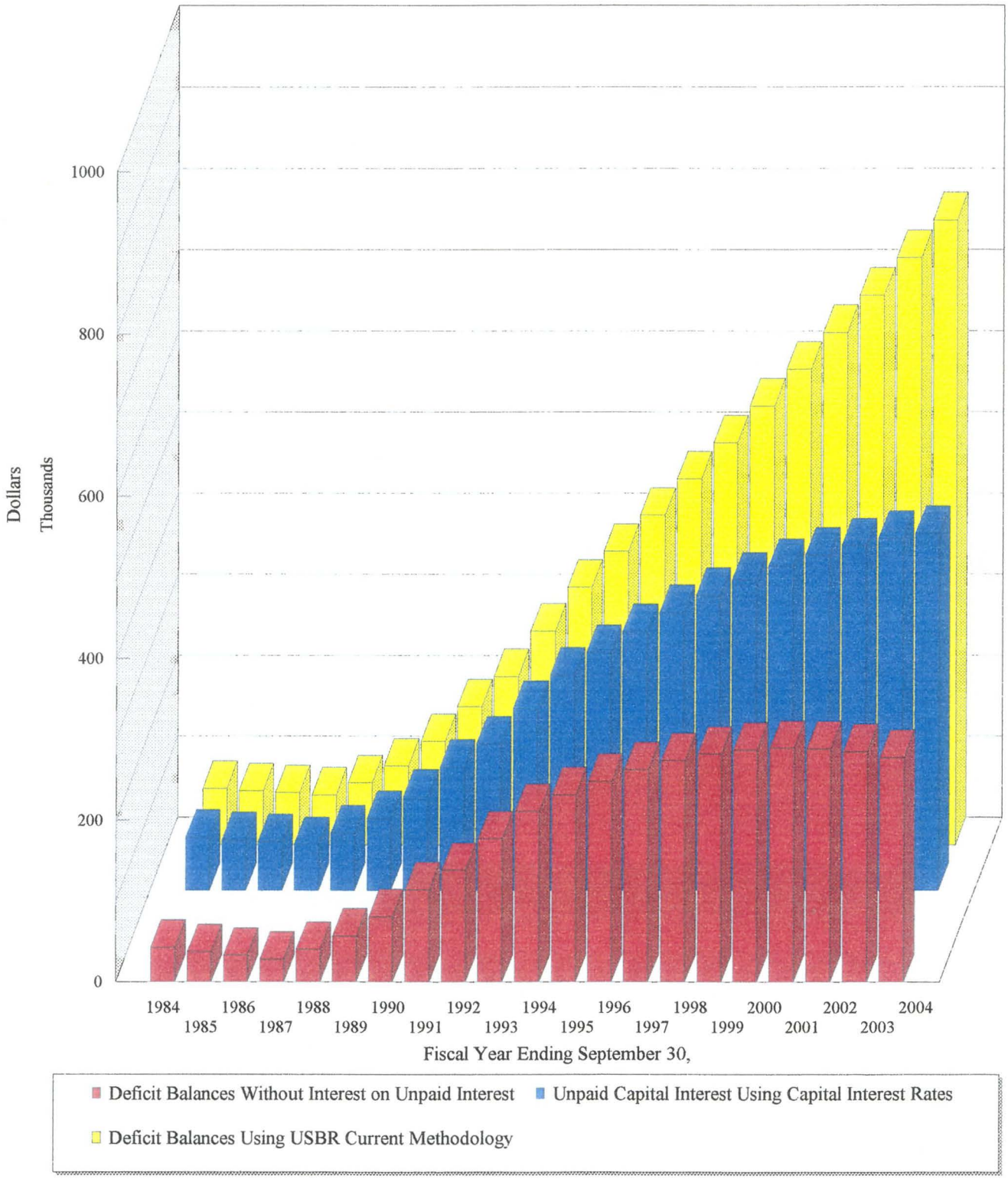






COMPARISON OF DEFICIT BALANCES

USING DIFFERENT METHODOLOGIES



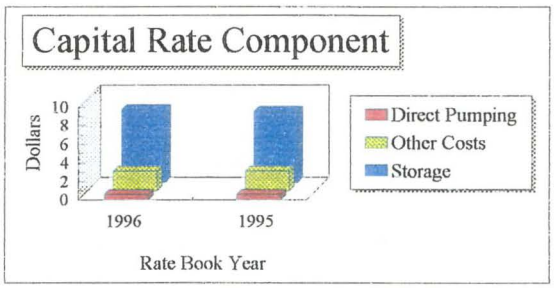
Clear Creek Community Services District

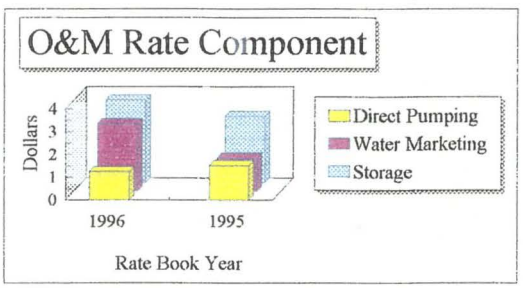
APPENDIX C

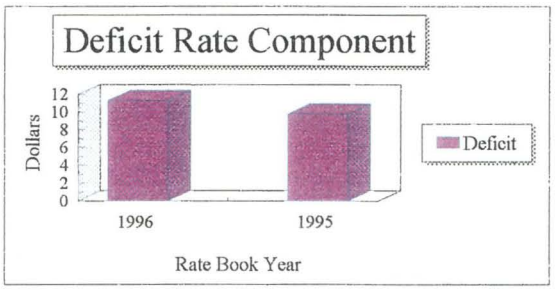
CONTRA COSTA WATER DISTRICT

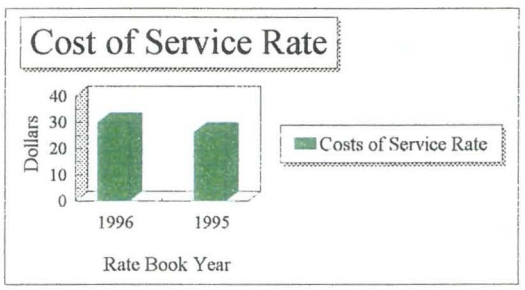
Contra Costa WD
Analysis of changes in water rates between the 1995 and 1996 Rate Books

	Water Rate Year 1996	Water Rate Year 1995	Difference	Percentage Change From Prior Year
Cost of Service Rate				
Capital Rate Component				
Storage	$7.88	$7.68	$0.20	2.6042%
Conveyance				
Conveyance Pumping				
Direct Pumping	0.61	0.59	0.02	3.3898%
Other Costs	2.20	2.17	0.03	1.3825%
Total Capital Rate	10.69	10.44	0.25	2.3946%
O&M Rate Component				
Water Marketing	2.98	1.47	1.51	102.7211%
Storage	3.64	2.92	0.72	24.6575%
Conveyance				
Conveyance Pumping				
Direct Pumping	1.25	1.52	-0.27	-17.7632%
Total O&M Rate	7.87	5.91	1.96	33.1641%
Deficit Rate Component				
Interest Bearing	11.29	9.80	1.49	15.2041%
Total Deficit Rate	11.29	9.80	1.49	15.2041%
Costs of Service Rate	$29.85	$26.15	$3.70	14.1491%



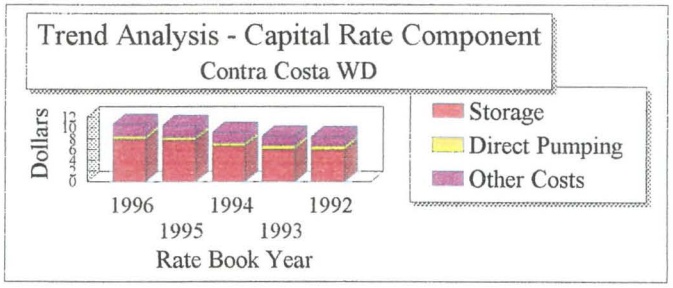


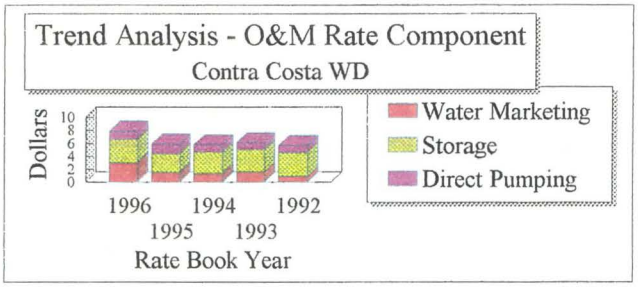


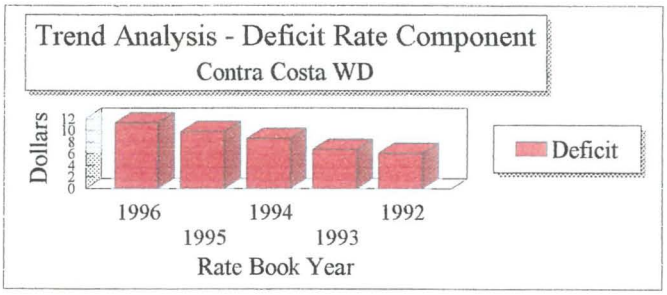


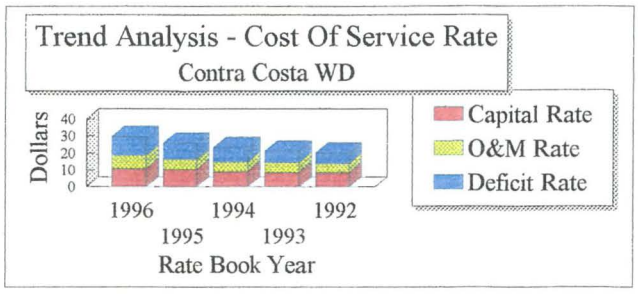
Contra Costa WD
Five Year Trend Analysis for Rate Book Years 1992 - 1996

	1996	1995	1994	1993	1992
Capital Rate Component					
Storage	7.88	7.68	6.52	5.97	5.92
Direct Pumping	0.61	0.59	0.61	0.68	0.65
Other Costs	2.20	2.17	2.01	1.82	1.79
	10.69	10.44	9.14	8.47	8.35
O&M Rate Component					
Water Marketing	2.98	1.47	1.31	1.58	0.94
Storage	3.64	2.92	3.31	3.46	3.60
Direct Pumping	1.25	1.52	1.14	1.05	1.13
	7.87	5.91	5.76	6.09	5.67
Deficit Rate Component					
Interest Bearing Deficit	11.29	9.80	8.65	6.73	6.15
	11.29	9.80	8.65	6.73	6.15
Cost of Service Rate					
Capital Rate	10.69	10.44	9.14	8.47	8.35
O&M Rate	7.87	5.91	5.76	6.09	5.67
Deficit Rate	11.29	9.80	8.65	6.73	6.15
	29.85	26.15	23.55	21.29	20.17



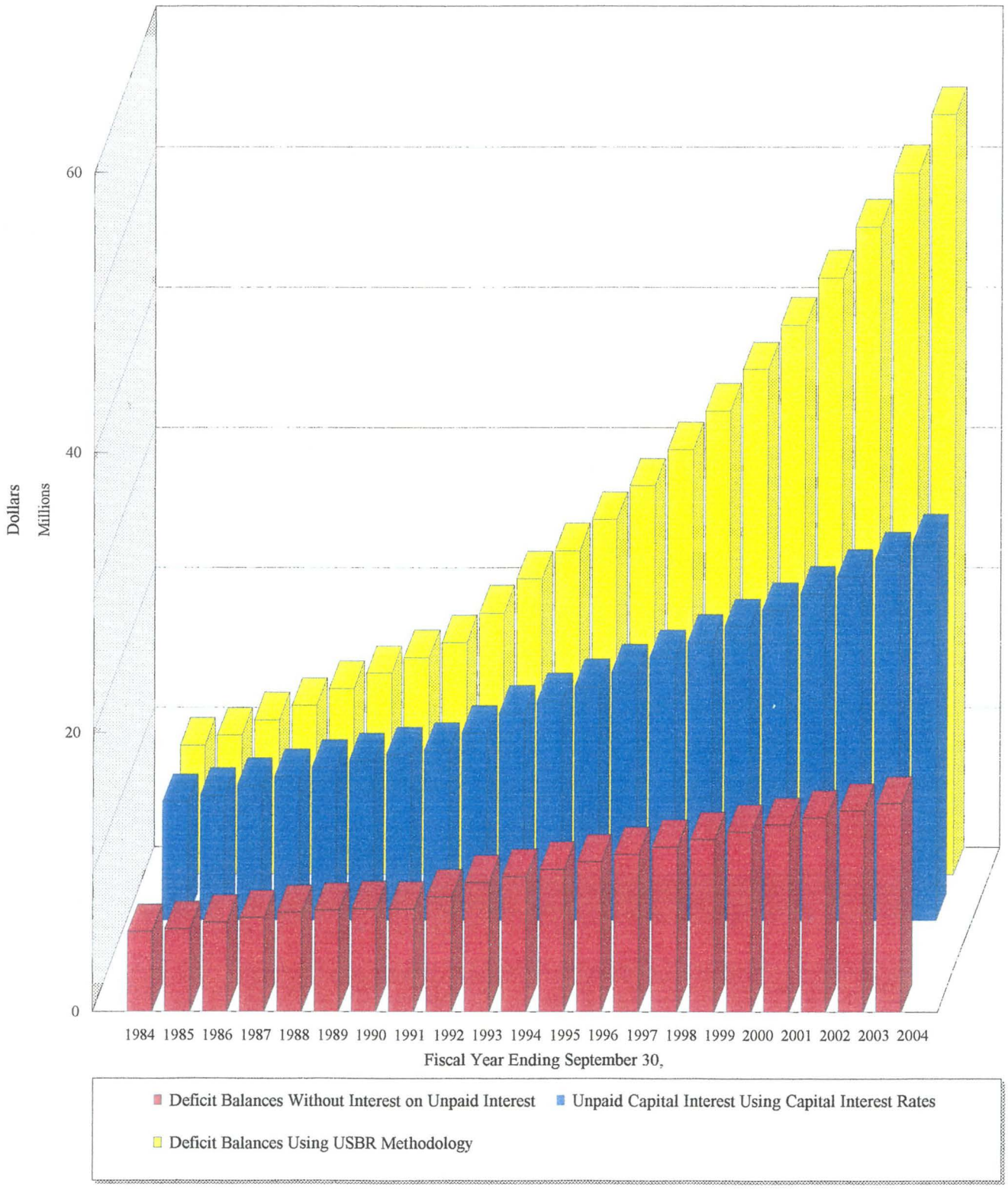






COMPARISON OF DEFICIT BALANCES

USING DIFFERENT METHODOLOGIES



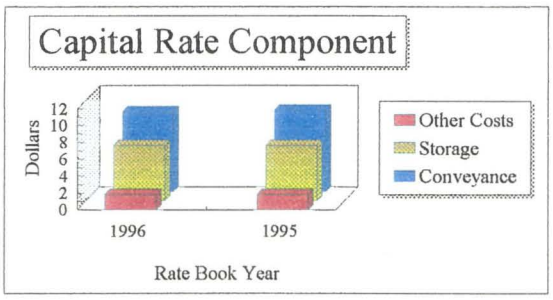
Contra Costa Water District

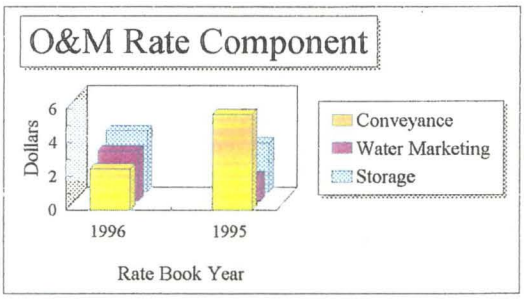
APPENDIX D

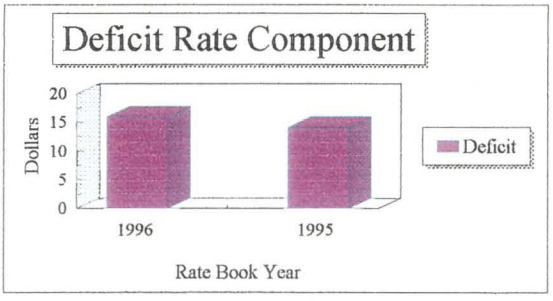
EAST BAY MUNICIPAL UTILITY DISTRICT

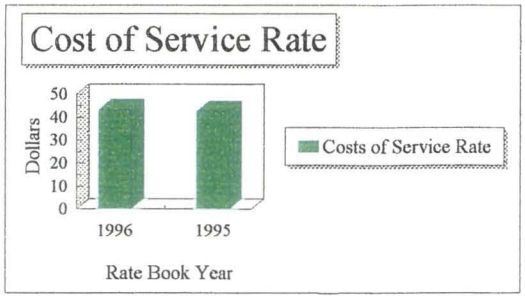
East Bay MUD
Analysis of changes in water rates between the 1995 and 1996 Rate Books

	Water Rate Year 1996	1995	Difference	Percentage Change From Prior Year
Cost of Service Rate				
Capital Rate Component				
Storage	$6.63	$6.62	$0.01	0.1616%
Conveyance	9.52	9.74	-0.22	-2.2447%
Conveyance Pumping				
Direct Pumping				
Other Costs	1.85	1.87	-0.02	-1.1821%
Total Capital Rate	18.00	18.23	-0.23	-1.2617%
O&M Rate Component				
Water Marketing	2.98	1.47	1.51	102.7211%
Storage	3.64	2.92	0.72	24.6575%
Conveyance	2.44	5.68	-3.24	-57.0423%
Conveyance Pumping				
Direct Pumping				
Total O&M Rate	9.06	10.07	-1.01	-10.0298%
Deficit Rate Component				
Interest Bearing	15.98	14.13	1.85	13.0927%
Total Deficit Rate	15.98	14.13	1.85	13.0927%
Costs of Service Rate	$43.04	$42.43	$0.61	1.4377%



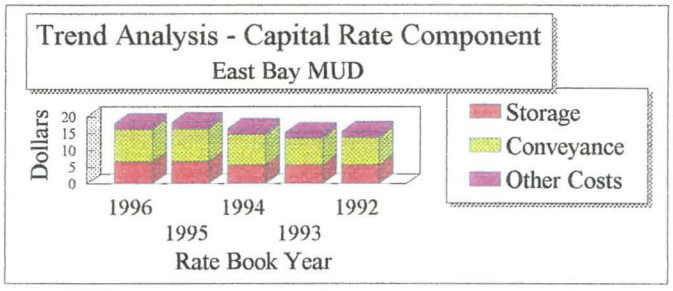


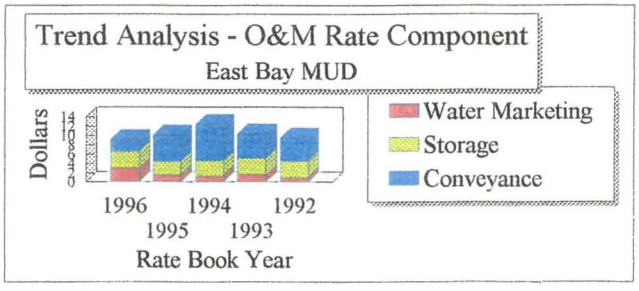


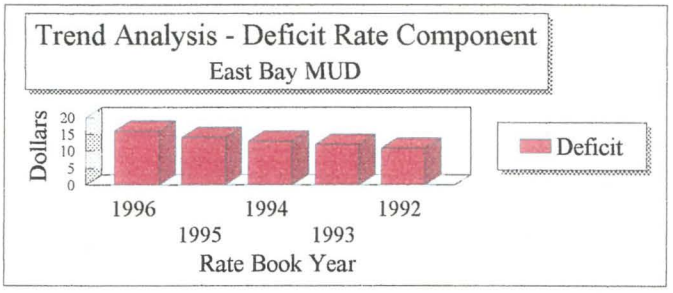


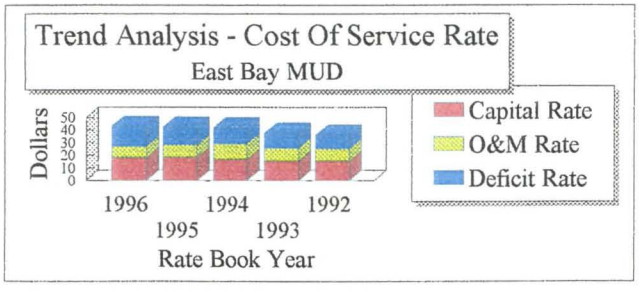
East Bay MUD
Five Year Trend Analysis for Rate Book Years 1992 - 1996

	1996	1995	1994	1993	1992
Capital Rate Component					
Storage	6.63	6.62	5.69	5.57	5.69
Conveyance	9.52	9.74	9.04	8.03	8.07
Other Costs	1.85	1.87	1.75	1.70	1.72
	18.00	18.23	16.48	15.30	15.48
O&M Rate Component					
Water Marketing	2.98	1.47	1.31	1.58	0.94
Storage	3.64	2.92	3.31	3.46	3.60
Conveyance	2.44	5.68	7.70	5.26	4.95
	9.06	10.07	12.32	10.30	9.49
Deficit Rate Component					
Interest Bearing Deficit	15.98	14.13	13.00	11.97	10.86
	15.98	14.13	13.00	11.97	10.86
Cost of Service Rate					
Capital Rate	18.00	18.23	16.48	15.30	15.48
O&M Rate	9.06	10.07	12.32	10.30	9.49
Deficit Rate	15.98	14.13	13.00	11.97	10.86
	43.04	42.43	41.80	37.57	35.83



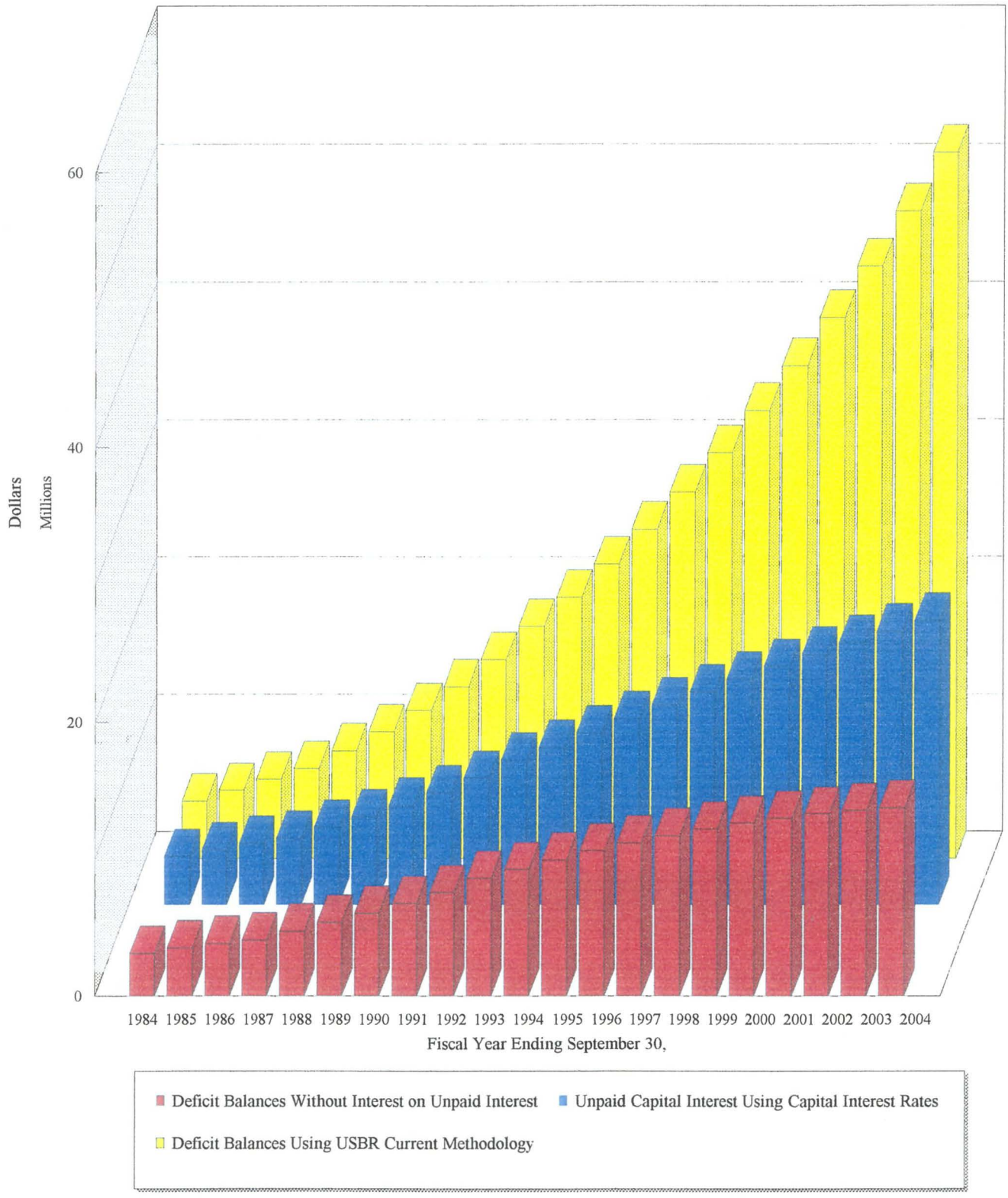






COMPARISON OF DEFICIT BALANCES

USING DIFFERENT METHODOLOGIES



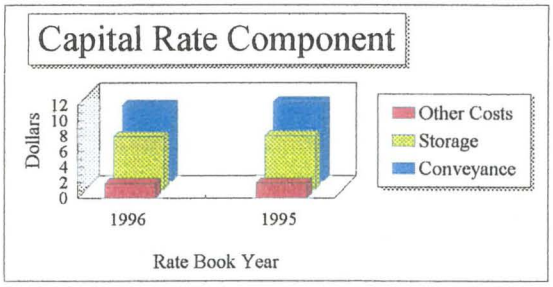
East Bay Municipal Utilities District

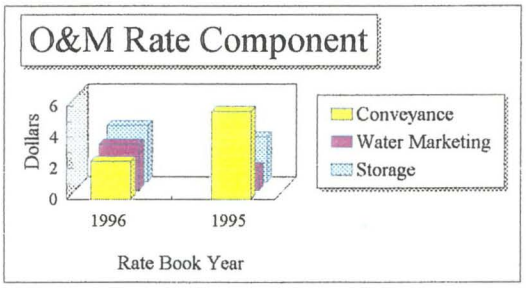
APPENDIX E

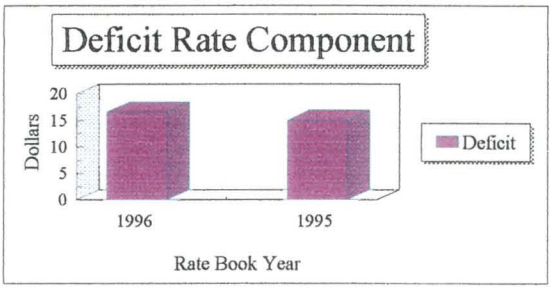
SACRAMENTO MUNICIPAL UTILITY DISTRICT

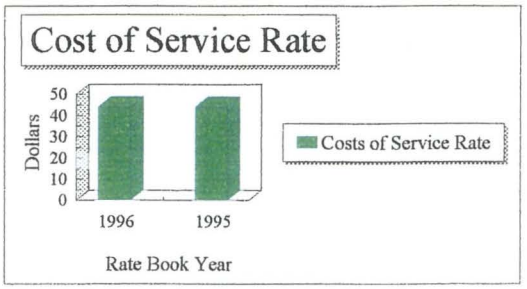
Sacramento MUD
Analysis of changes in water rates between the 1995 and 1996 Rate Books

	Water Rate Year 1996	Water Rate Year 1995	Difference	Percentage Change From Prior Year
Cost of Service Rate				
Capital Rate Component				
Storage	$6.80	$6.92	($0.11)	-1.6470%
Conveyance	9.77	10.17	-0.41	-4.0099%
Conveyance Pumping				
Direct Pumping				
Other Costs	1.90	1.96	-0.06	-2.9665%
Total Capital Rate	18.47	19.05	-0.58	-3.0446%
O&M Rate Component				
Water Marketing	2.98	1.47	1.51	102.7211%
Storage	3.64	2.92	0.72	24.6575%
Conveyance	2.44	5.68	-3.24	-57.0423%
Conveyance Pumping				
Direct Pumping				
Total O&M Rate	9.06	10.07	-1.01	-10.0298%
Deficit Rate Component				
Interest Bearing	16.57	15.00	1.57	10.4667%
Total Deficit Rate	16.57	15.00	1.57	10.4667%
Costs of Service Rate	$44.10	$44.12	($0.02)	-0.0453%



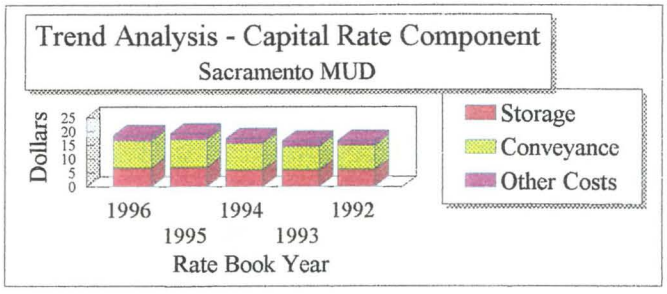


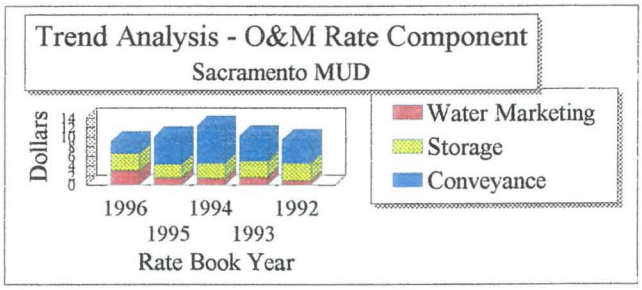


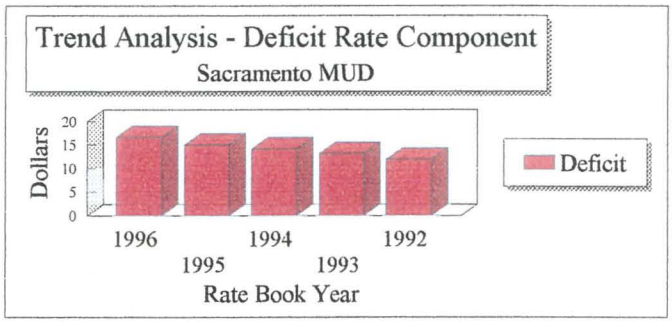


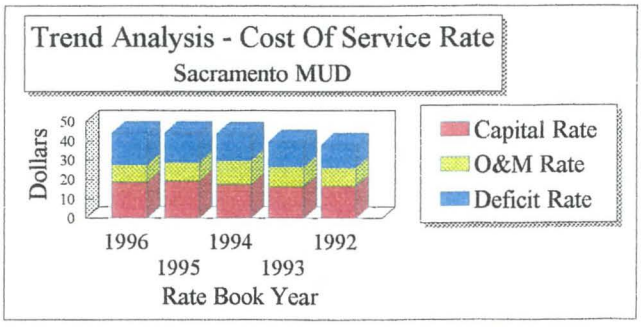
Sacramento MUD
Five Year Trend Analysis for Rate Book Years 1992 - 1996

	1996	1995	1994	1993	1992
Capital Rate Component					
Storage	6.80	6.92	6.02	5.96	6.12
Conveyance	9.77	10.17	9.57	8.58	8.69
Other Costs	1.90	1.96	1.85	1.82	1.85
	18.47	19.05	17.44	16.36	16.66
O&M Rate Component					
Water Marketing	2.98	1.47	1.31	1.58	0.94
Storage	3.64	2.92	3.31	3.46	3.60
Conveyance	2.44	5.68	7.70	5.26	4.95
	9.06	10.07	12.32	10.30	9.49
Deficit Rate Component					
Interest Bearing Deficit	16.57	15.00	14.15	13.19	11.93
	16.57	15.00	14.15	13.19	11.93
Cost of Service Rate					
Capital Rate	18.47	19.05	17.44	16.36	16.66
O&M Rate	9.06	10.07	12.32	10.30	9.49
Deficit Rate	16.57	15.00	14.15	13.19	11.93
	44.10	44.12	43.91	39.85	38.08



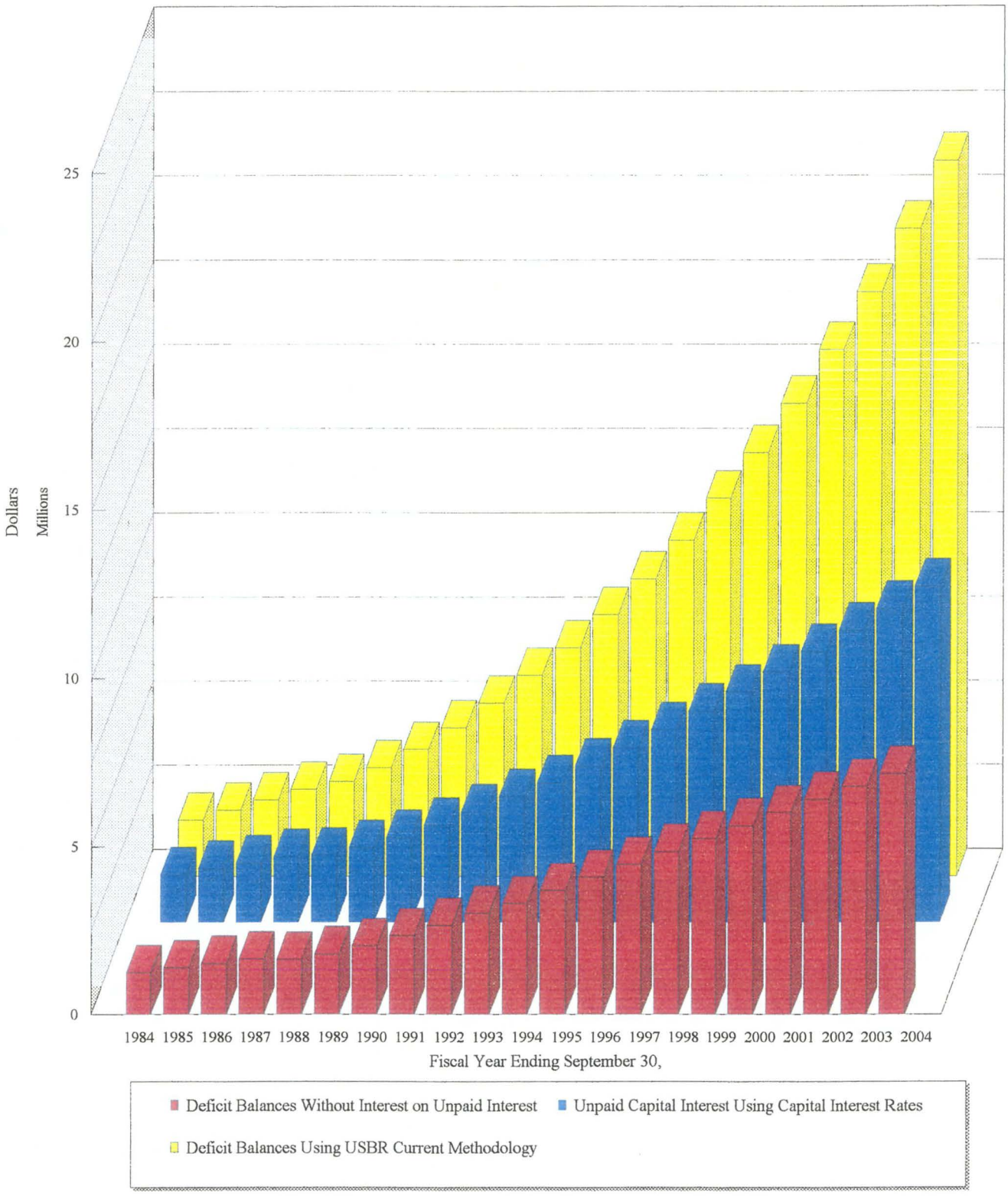






COMPARISON OF DEFICIT BALANCES

USING DIFFERENT METHODOLOGIES



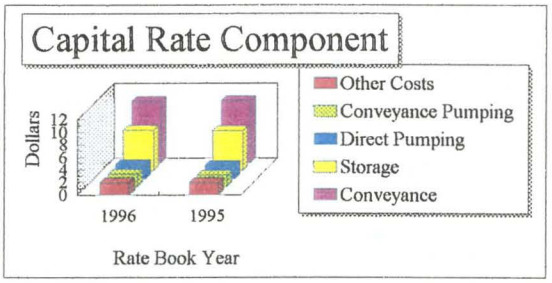
Sacramento MUD w/Delta Charge

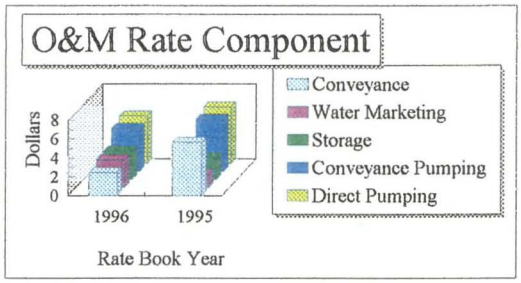
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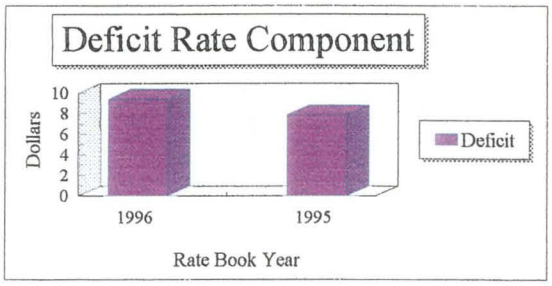
SANTA CLARA VALLEY WATER DISTRICT

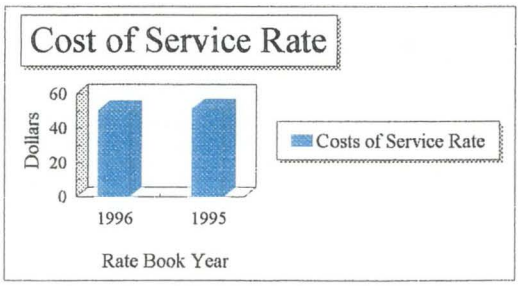
Santa Clara Valley WD - In Basin
Analysis of changes in water rates between the 1995 and 1996 Rate Books

	Water Rate Year 1996	Water Rate Year 1995	Difference	Percentage Change From Prior Year
Cost of Service Rate				
Capital Rate Component				
Storage	$6.54	$6.41	$0.13	2.0194%
Conveyance	9.86	9.91	-0.06	-0.5552%
Conveyance Pumping	2.02	1.89	0.13	7.0944%
Direct Pumping	2.27	2.16	0.11	5.1820%
Other Costs	1.92	1.91	0.01	0.5257%
Total Capital Rate	22.60	22.27	0.33	1.4818%
O&M Rate Component				
Water Marketing	2.98	1.47	1.51	102.7211%
Storage	3.06	2.40	0.66	27.5000%
Conveyance	2.44	5.68	-3.24	-57.0423%
Conveyance Pumping	4.64	5.60	-0.96	-17.1429%
Direct Pumping	5.10	6.03	-0.93	-15.4229%
Total O&M Rate	18.22	21.18	-2.96	-13.9754%
Deficit Rate Component				
Interest Bearing	9.40	7.87	1.53	19.4409%
Total Deficit Rate	9.40	7.87	1.53	19.4409%
Costs of Service Rate	$50.22	$51.32	($1.10)	-2.1434%



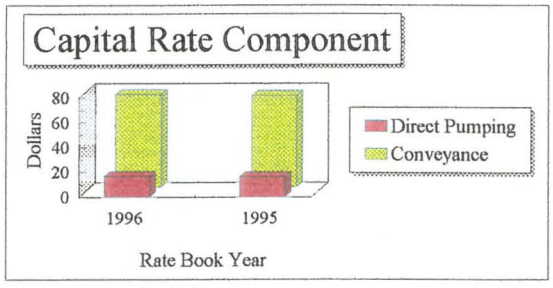


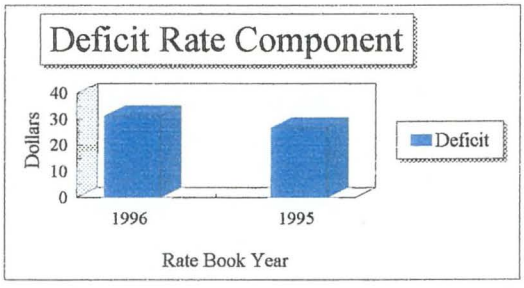


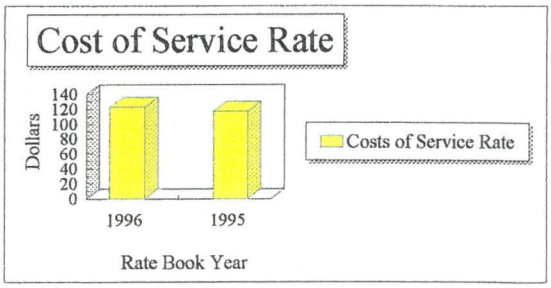


Santa Clara Valley WD - Out Of Basin
Analysis of changes in water rates between the 1995 and 1996 Rate Books

	Water Rate Year 1996	Water Rate Year 1995	Difference	Percentage Change From Prior Year
Cost of Service Rate				
Capital Rate Component				
Storage				
Conveyance	$74.92	$73.84	$1.08	1.4679%
Conveyance Pumping				
Direct Pumping	16.64	16.41	0.23	1.3780%
Other Costs				
Total Capital Rate	91.56	90.25	1.31	1.4515%
O&M Rate Component				
Water Marketing				
Storage				
Conveyance				
Conveyance Pumping				
Direct Pumping				
Total O&M Rate	0.00	0.00	0.00	N/A
Deficit Rate Component				
Interest Bearing	31.24	26.71	4.53	16.9599%
Total Deficit Rate	31.24	26.71	4.53	16.9599%
Costs of Service Rate	$122.80	$116.96	$5.84	4.9932%

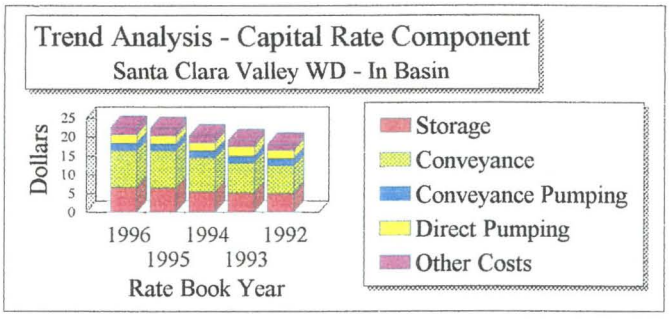


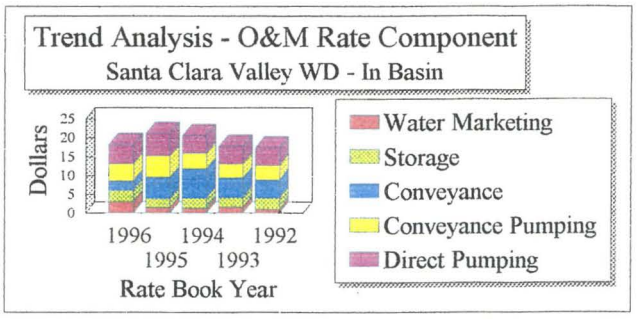


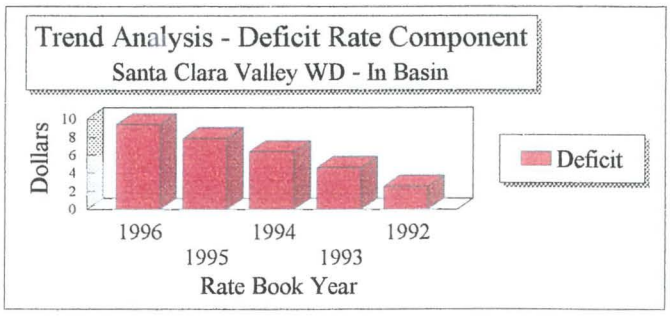


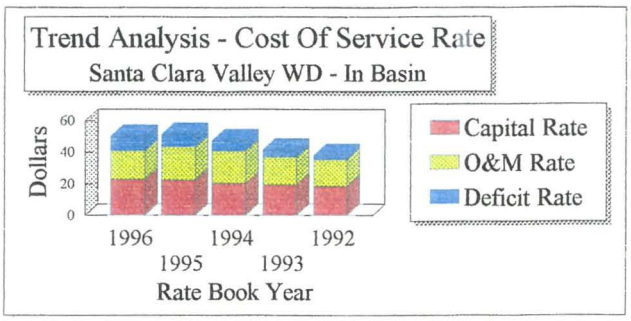
Santa Clara Valley WD - In Basin
Five Year Trend Analysis for Rate Book Years 1992 - 1996

	1996	1995	1994	1993	1992
Capital Rate Component					
Storage	6.54	6.41	5.40	5.19	4.96
Conveyance	9.86	9.91	9.08	7.90	7.43
Conveyance Pumping	2.02	1.89	1.82	1.90	1.80
Direct Pumping	2.27	2.16	2.25	2.46	2.31
Other Costs	1.92	1.91	1.76	1.68	1.58
	22.60	22.27	20.31	19.13	18.08
O&M Rate Component					
Water Marketing	2.98	1.47	1.31	1.58	0.94
Storage	3.06	2.40	2.73	2.57	3.00
Conveyance	2.44	5.68	7.70	5.26	4.95
Conveyance Pumping	4.64	5.60	4.18	3.70	3.75
Direct Pumping	5.10	6.03	4.71	4.65	4.69
	18.22	21.18	20.63	17.76	17.33
Deficit Rate Component					
Interest Bearing Deficit	9.40	7.87	6.40	4.64	2.54
	9.40	7.87	6.40	4.64	2.54
Cost of Service Rate					
Capital Rate	22.60	22.27	20.31	19.13	18.08
O&M Rate	18.22	21.18	20.63	17.76	17.33
Deficit Rate	9.40	7.87	6.40	4.64	2.54
	50.22	51.32	47.34	41.53	37.95



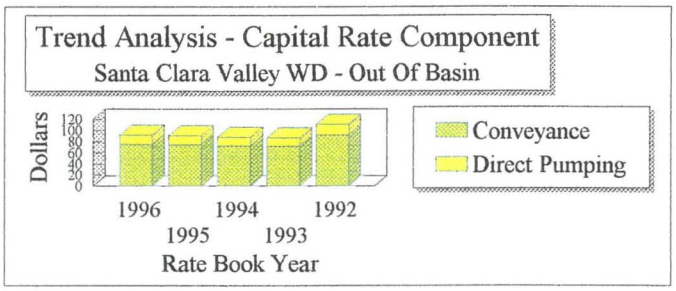


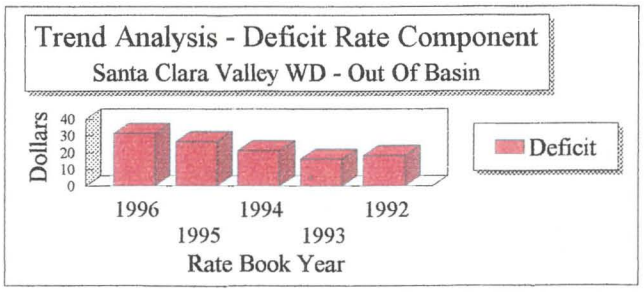


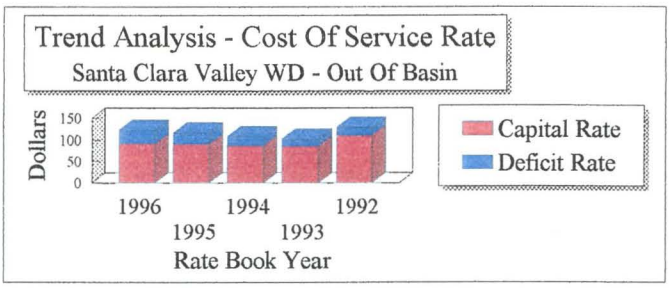


Santa Clara Valley WD - Out Of Basin
Five Year Trend Analysis for Rate Book Years 1992 - 1996

	1996	1995	1994	1993	1992
Capital Rate Component					
Conveyance	74.92	73.84	72.42	71.44	91.64
Direct Pumping	16.64	16.41	15.10	14.72	18.96
	91.56	90.25	87.52	86.16	110.60
Deficit Rate Component					
Interest Bearing Deficit	31.24	26.71	21.23	16.23	18.46
	31.24	26.71	21.23	16.23	18.46
Cost of Service Rate					
Capital Rate	91.56	90.25	87.52	86.16	110.60
Deficit Rate	31.24	26.71	21.23	16.23	18.46
	122.80	116.96	108.75	102.39	129.06

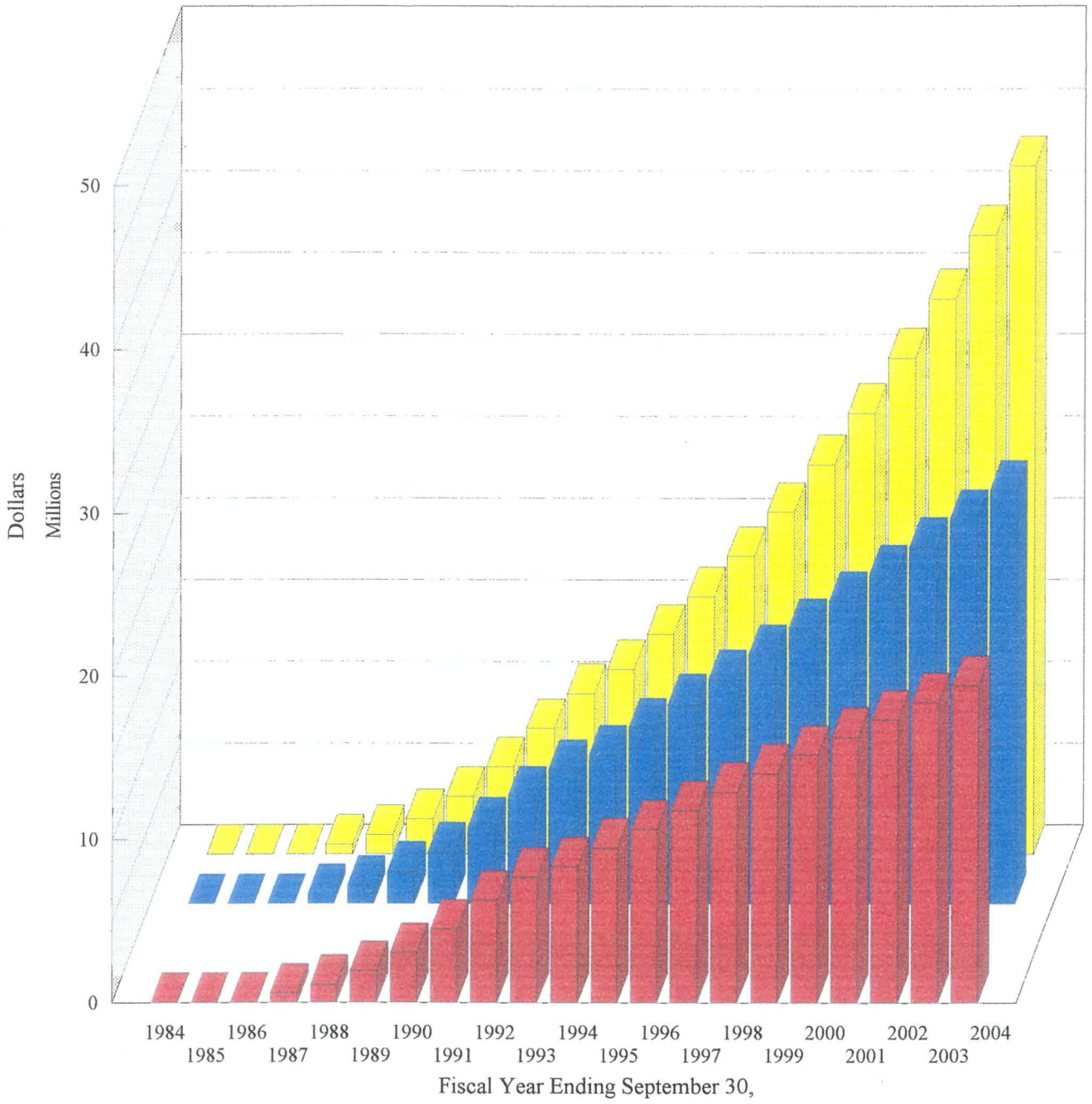






COMPARISON OF DEFICIT BALANCES

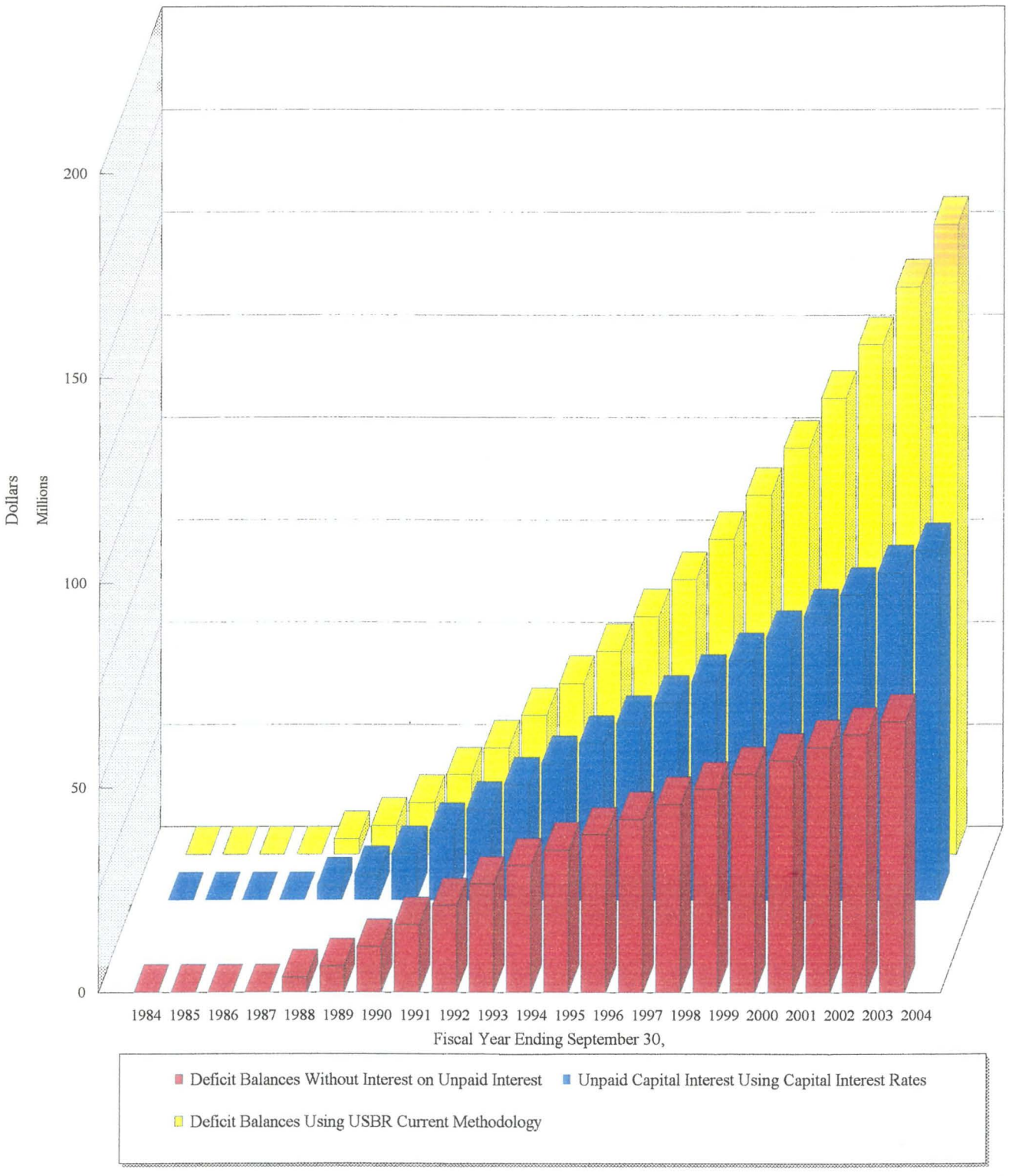
USING DIFFERENT METHODOLOGIES



Santa Clara Valley Water District
In Basin

COMPARISON OF DEFICIT BALANCES

USING DIFFERENT METHODOLOGIES



Santa Clara Valley Water District
Out of Basin